ENVIRONMENTAL IMPACT STATEMENT

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POSED DOMESTIC LIVESTOCK GRAZING PROGRAM

Mount Dome Planning Unit

UNITED STATES DEPARTMENT OF THE INTERIOR
BUREAU OF LAND MANAGEMENT

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United States Department of the Interior

BUREAU OF LAND MANAGEMENT
REDDING DISTRICT OFFICE
355 Hemsted Drive
Redding, California 96001

Dear Reviewer:

The Bureau of Land Management proposes to implement a livestock grazing program on 37,595 acres of public grazing land in the Mount Dome area of northern California. The overall objective is to improve vegetation condition and improve forage production for multiple use on a sustained-yield basis. Components of the proposed action include:

(1) Adjustments of authorized livestock use;
(2) Introduction of grazing treatments; and
(3) Range projects and facilities, including vegetation manipulation and construction of reservoirs, fencing, pipeline, and a water tank and troughs.

Intensity of these components varies under five alternative plans. Environmental consequences of each of the alternatives are described in an introductory summary and in Chapter 3 of the environmental impact statement.

For further information contact:

Jan Miller
Siskiyou Area Manager
355 Hemsted Drive
Redding, California 96002
Telephone: (916) 246-5400

We must receive your comments by so that we may respond to them in the final environmental impact statement and consider them in our forthcoming decisions.

Sincerely yours,

Stanley D. Butzer
District Manager
Redding District

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Draft Environmental Impact Statement

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PROPOSED DOMESTIC LIVESTOCK GRAZING MANAGEMENT PROGRAM

FOR THE

MOUNT DOME RESOURCE AREA

DES 80-58

SISKIYOU AND MODOC COUNTIES, CALIFORNIA

Department of the Interior
Bureau of Land Management

State Director, California

Bureau of Land Management
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SUMMARY

This environmental impact statement (EIS) examines the environmental consequences of five alternative livestock grazing management plans for the Mount Dome Planning Unit in northern California. The alternative selected would be implemented on 37,595 acres of public grazing lands presently divided into 27 leased allotments.

The major objective of the alternative grazing management programs is to improve range condition and raise forage production to better meet declared multiple-use and sustained-yield goals.

Major Issues

The primary issues identified during planning for the Mount Dome EIS involved allocation of vegetation among potentially conflicting uses. Major uses of the vegetation include consumption by livestock (cattle and sheep), wild horses, and big game (deer and antelope), and non-consumptive use for watershed, aesthetics, wildlife, and continued plant vigor and reproduction.

Another important issue identified was the conflict between livestock grazing and cultural resources.

Alternative Plans

Five alternatives (described below) were developed for analysis in the EIS. The moderate-use alternative was identified as the preferred alternative prior to the beginning of the draft EIS. A final decision on the alternative to be implemented will be made after the final EIS is filed.

Moderate Use Alternative (Preferred)

Total licensed livestock grazing would be reduced 37 percent from 5441 animal unit months (AUMs) to 3418 AUMs. Individual allotments would be adjusted by increases (up to 122 percent) on two allotments and decreases (up to 70 percent) on 25 allotments. The wild horse herd, which now numbers about 20, would be reduced to sixteen animals. Different grazing treatments, including six allotments under rest seasonal and four allotments under deferred seasonal, would be initiated. Two existing allotments would remain, one under a rest-rotation system and one under a deferred seasonal system. Fifteen allotments would remain under continuous seasonal treatment.

Range projects, including vegetation manipulation on 3360 acres and construction of 10 reservoirs, 1.5 miles of pipeline, one storage tank and 32.5 miles of fence, would be completed.

No Action Alternative

Present livestock licensed use (5441 AUMs) and treatments would remain

the same. The wild horse herd would be kept at its approximate present level of 20.

Primitive Use Alternative

No livestock grazing would be authorized on public lands. One hundred four miles of fencing would be constructed to protect public lands from livestock. The wild horse herd would be allowed to increase to a level (approximately 47 animals) compatible with a sound ecological balance on its present range.

Limited Use Alternative

Total licensed livestock use would be reduced by 93 percent to 388 AUMs. All remaining allotments would be under continuous seasonal grazing treatment. The wild horse herd would be reduced from 20 to 16 animals. Range projects would be the same as under the moderate use alternative except that 390 acres of manipulated vegetation would be burned but not seeded and only about one mile of fence would be constructed.

Exclusive Use Alternative

Total licensed livestock use would be reduced by 12 percent to 4799 AUMs. All wild horses would be removed. Range projects would be the same as under the moderate use alternative.

Livestock use on individual allotments would be adjusted to match allocatable forage production through increases up to 174 percent and decreases up to 53 percent from present.

Significant Impacts

None of the impacts of the alternatives are considered to be significant in national or regional terms. Impacts in this summary are limited to those considered to be noteworthy in the Mount Dome EIS area. Other consequences of the proposed action may be found described by alternative in Chapter 3. All impacts described below are for the long term (20 years from action implementation) unless otherwise noted. Impacts are shown in Chapter 1, Table 1-8.

Moderate Use Alternative (Preferred)

Vegetation ecological condition would improve one condition class from poor to fair or fair to good, trend would move to "improving" from "stable" or "declining", and forage production would increase by 52 percent (4799 allocatable AUMs to 7294).

Improved winter deer herd habitat resulting from improved forage quantity and quality would facilitate increased birth rates and reduced death rates.

Short-term visual degradation would result from the proposed juniper hand felling and construction of the proposed reservoirs.

Because of the low dependency of Mount Dome EIS livestock operators on public grazing land, most operators would not be significantly affected by initial livestock allocation cuts. The two operators most affected would have to reduce their herd size by 20 percent (sheep) and 12 percent (cattle). Long-term gains in forage production, if allocated for future livestock use, would more than offset the economic effects of the total initial allocation cuts.

No Action Alternative

Vegetation trend would continue as it presently is. Overall ecological condition would deteriorate. Production would decline 5 percent (4,799 allocatable AUMs to 4,579). Further losses of archaeological data would result from continued livestock and wild horse disturbance.

Primitive Use Alternative

Except in the wild horse range, vegetation condition and trend would improve more quickly and to a greater extent due to reduced consumption than under the moderate use alternative. Forage production would increase 47 percent over present (4,799 allocatable AUMs to 7,047).

The wild horse herd would increase to approximately 47 animals. Herd viability would be improved because of the increased number.

Improved habitat condition, resulting in improved health, increased birth rates and decreased death rates of the winter deer herd would be greater than under the moderate use alternative.

Losses of archaeological data would increase on the wild horse range and decrease on other public lands where grazing has been eliminated.

Because larger livestock operations depend little on public grazing lands and most smaller operations are believed to use livestock as a supplement to other income sources, elimination of livestock grazing would have insignificant effects on most individual operators and the economy of the EIS area. Greatest required reduction in herd size would be 30 to 35 percent.

Limited Use Alternative

Vegetation condition and trend would improve more quickly and to a greater extent due to reduced consumption than under the moderate use alternative. Forage production would increase 51 percent over present (4,799 allocatable AUMs to 7,229).

Improved habitat condition, resulting in improved health, increased birth rates and decreased death rates of the winter deer herd would be greater than under the moderate use alternative.

Losses of archeological data would diminish due to decreased livestock and wild horse numbers.

Short-term visual degradation would result from reservoir construction and juniper felling.

Economic effects would be limited to a small portion of operators as described under the primitive use alternative above.

Exclusive Use Alternative

More uniform forage utilization would result from adjusting stocking levels proportionate to each allotment's forage production.

Most vegetation trend would become stable, with ecological condition remaining at the present level. Annual forage production would increase 5 percent from present (4,799 allocatable AUMs to 5,039).

The wild horse herd would be removed from the public lands.

Improved wildlife distribution would result from more uniform forage utilization by livestock.

Loss of archaeological data in the wild horse herd area would decline.

Short-term visual degradation would result from reservoir construction and juniper felling.

Declines in key deer forage supply and resulting increased mortality and crop depredation would continue over both the short and long-term although not as severely as under the no action alternative.

Authorized livestock grazing levels would vary from an increase of 174 percent to a reduction of 53 percent among operators. Because of the low dependency on public grazing lands, resulting economic affects would be insignificant. Total authorized grazing would be reduced by 12 percent from present (5,441 AUMs to 4,799).

Rationale for Selection of Preferred Alternative

The moderate use alternative was selected as the preferred alternative as it meets the objective of protecting and enhancing the vegetation resource of the Mount Dome Planning Unit while providing for a balanced use of all resources, consumptive and non-consumptive, traditional and non-traditional. The vegetation resource would be allocated to provide for reasonable levels of livestock grazing and use by wildlife and wild horses. One half of the forage production would be designated for non-consumptive use and for plant vigor.

The preferred alternative also recognizes and provides for human values such as visual resources, cultural resources, and recreational opportunities found in the planning unit.

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CHAPTER 1

DESCRIPTION OF ALTERNATIVES

PURPOSE OF AND NEED FOR ACTION

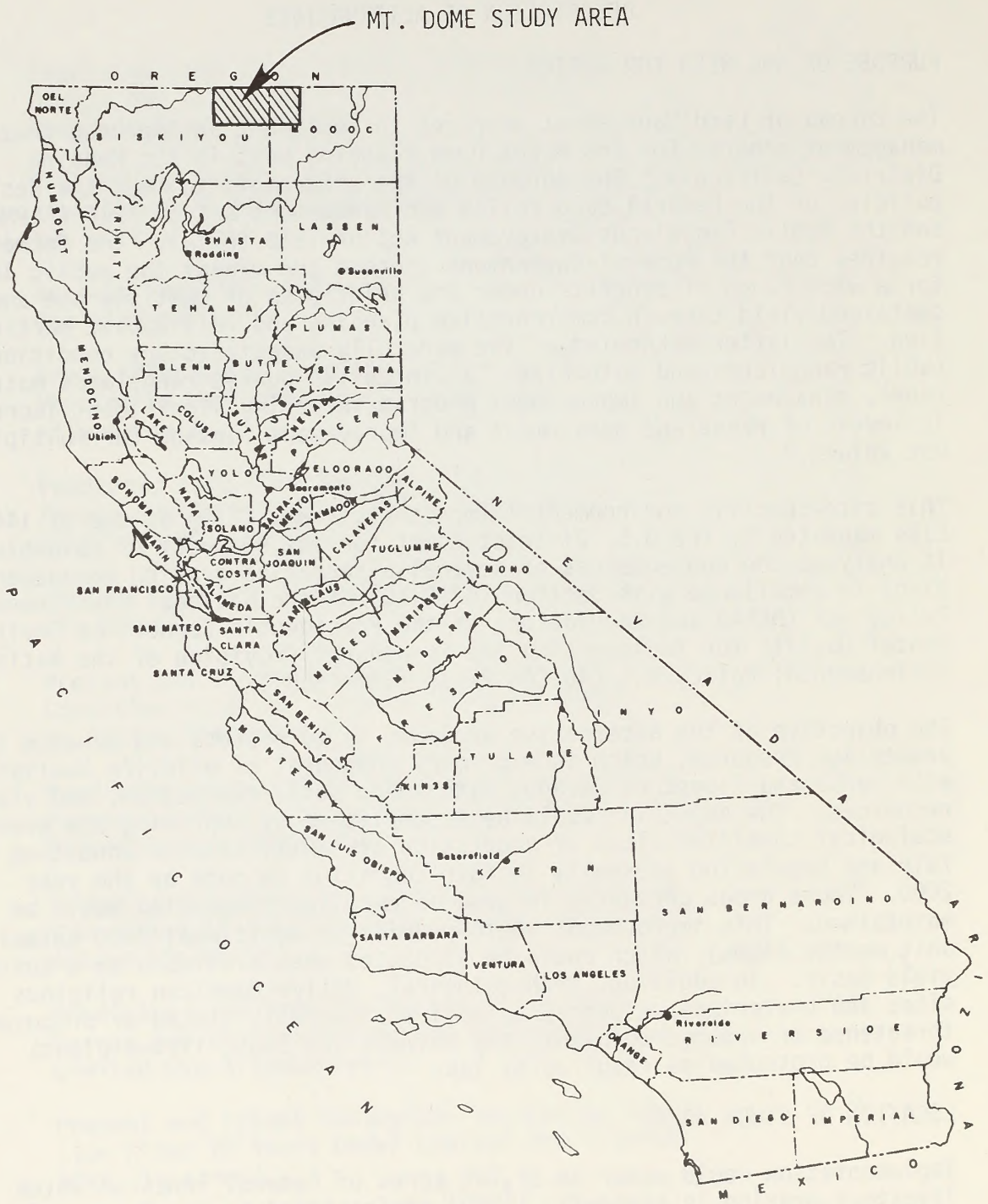
The Bureau of Land Management proposes to implement an improved grazing management program for the Mount Dome Planning Unit in its Redding District, California. The purpose of the program is to meet the declared policies of the Federal Land Policy and Management Act of 1976 (FLPMA) and the Public Rangelands Improvement Act of 1978 (PRIA). The former requires that the Federal Government protect and manage the public lands for a wide range of benefits under the principles of multiple use and sustained yield through comprehensive planning and full public participation. The latter acknowledges the generally unsatisfactory condition of public rangelands and authorizes "an intensive public rangelands maintenance, management and improvement program involving significant increases in levels of rangeland management and improvement funding for multiple use values."

This site-specific environmental impact statement (EIS) is one of 144 EISs mandated by the U.S. District Court for the District of Columbia. It analyzes the consequences of several alternative grazing management plans in compliance with Section 102(2)(C) of the National Environmental Policy Act (NEPA) and Regulations of the President's Council on Environmental Quality for Implementing the Procedural Provision of the National Environmental Policy Act (40 CFR Parts 1500-1508).

The objective of the alternative programs is to protect and enhance the vegetation resource, which is a primary component of wildlife habitat, wild horse and livestock forage, watershed, soil, recreation, and visual resources. The objective would be accomplished by improving the average ecological condition class of vegetation presently in poor condition to fair and vegetation presently in fair condition to good by the year 2000. Those areas presently in good or excellent condition would be maintained. This improvement would provide an additional 2500 animal unit months (AUMs), which could be allocated when available on a sustained-yield basis. In addition, archaeological, Native American religious sites and historical resources as well as federally listed or proposed threatened or endangered plants and animals and State-listed plants would be protected as required by law.

LOCATION OF STUDY AREA

Implementation would occur on 37,595 acres of Federal lands on which livestock grazing is presently (1980) administered by the Bureau of Land Management (BLM), Redding District, within the Mount Dome Planning Unit in northern California (Map 1-1). This includes public lands (land totally administered by BLM) and other Federal lands withdrawn by the U.S. Fish and Wildlife Service but with grazing administered by BLM. Throughout this EIS, the phrase "Mount Dome Planning Unit" will indicate the area within the Planning Unit boundaries, the phrase "EIS area" will indicate areas in or near the Planning Unit and the phrase "public grazing lands" will indicate only the areas subject to the action of the alternatives.


MT. DOME STUDY AREA
O R E G O N
DEL NORTE
SISKIYOU
MODOC
HUMBOLDT
TRINITY
SHASTA
Redding
LASSEN
Susanville
TEHAMA
PLUMAS
GLENN
BUTTE
SIERRA
MENDOCINO
Ukiah
LAKE
COLUSA
SUTTER
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INYO
SAN BENITO
MONTEREY
TULARE
KINGS
SAN LUIS OBISPO
Bakersfield
KERN
SAN BERNARDINO
SANTA BARBARA
VENTURA
LOS ANGELES
Riverside
ORANGE
RIVERSIDE
SAN DIEGO
IMPERIAL
PACIFIC OCEAN
NEVADA
ARIZONA
MEXICO

DESCRIPTION OF ALTERNATIVES

To effectively examine the management options, five basic alternatives were selected to represent the range of reasonable initial possibilities. The moderate use alternative was identified as the preferred alternative through the Management Framework Plan, Step II (MFP II) level of the BLM planning process. The alternative which is finally selected and implemented would serve as a management starting point. Monitoring and evaluation would determine the action's effectiveness and if there is a need for modification of the action. The five alternatives are outlined in Table 1-1.

Primitive Use

General Use - The overall purpose of management would be to preserve the area in a more or less natural condition. Other uses may be allowed to the extent that they would not degrade the natural condition.

Specific Use - No forage would be allocated to livestock under this alternative. Protection of wildlife habitat, archaeological sites, and watershed values would be emphasized. Range facilities and treatments would be severely restricted. Wild horses would be managed to achieve and maintain ecological balance of the habitat within the present horse range (approximately 47 animals).

Limited Use

General Use - Protection of natural values would be more important than consumptive uses, such as timber or minerals production, or livestock forage. While these uses would not be precluded, they would be restricted or limited to protect other resource values. For example, wildlife habitat or visual resources would receive more emphasis than commodity production.

Specific Use - Most of the available forage would be allocated to present and potential big game needs. Only excess forage would be allocated to livestock. Vegetation manipulation to enhance wildlife habitat would be implemented. Wild horses would be managed to initially maintain approximately sixteen animals until such time that their habitat can support additional horses commensurate with the needs of other consumers.

Moderate Use (Preferred)

General Use - This use would provide for the full range of resource uses that are as unrestricted as possible. The production of goods and services would be maximized and would only be constrained by other uses or technical considerations. For example, livestock forage production would be maximized within the constraints of good soil and watershed management and forage needs.

Specific Use - Vegetation would be allocated for multiple resource support throughout the planning unit, (watershed, plant maintenance,

TABLE 1-1 CONSUMPTIVE VEGETATION ALLOCATION IN AUMs BY ALTERNATIVE (WITH PERCENT CHANGE FROM 1980 LIVESTOCK LEVEL)

Map Key No.	Allotments By Grazing Treatment **	Allotment Acreage	Allocatable Forage in AUMs 50% of Annual production	PROPOSED ALTERNATIVES: Primitive Use (No Livestock Grazing) Live-Stock	Big Game	Wild Horses	Limited Use (Maximize Wildlife) Live-Stock	Big Game	Wild Horses	Moderate Use (Preferred Alternative) Live-Stock	Big Game	Wild Horses	Exclusive Use (Maximize Livestock) Live-Stock	Big Game	Wild Horses	No Action (1979 Level) *** Live-Stock	Big Game	Wild Horses
	Rest Seasonal																	
1	Ericson, Don	1279	128	0	23	105	0 (-100%)	92	36	54 (-36%)	38	36	128 (+51%)	0	0	85	18	0
2	Johnson, Stanley	559	86	0	86	-	19 (-83%)	67	-	74 (-33%)	12	-	86 (-23%)	0	-	111	0	-
3	Johnson/Dalton/Hal.	77	7	0	7	-	1 (-95%)	6	-	5 (-67%)	2	-	7 (-53%)	0	-	15	0	-
4	Loveness Lumber	685	128	0	128	-	27 (-84%)	101	-	114 (-33%)	14	-	128 (-25%)	0	-	171	0	-
5	Orahood	439	71	0	51	20	0 (-100%)	64	7	47 (+62%)	17	7	71 (+145%)	0	0	29	8	0
6a	Parsons/Robinson	1422	165	0	165	-	28 (-77%)	137	-	117 (-03%)	48	-	165 (+38%)	0	-	120	12	-
	Deferred Seasonal																	
7	Criss	452	40	0	40	-	2 (-96%)	38	-	23 (-54%)	17	-	40 (-20%)	0	-	50	0	-
8a	Porterfield Rch 1	4699	633	0	307	326	0 (-100%)	522	111	373 (-56%)	149	111	633 (-26%)	0	0	853	85	0
9a	Truax-Red Rock	846	78	0	78	-	19 (-88%)	59	-	46 (-70%)	32	-	78 (-49%)	0	-	153	12	-
10a	Tablelands South	1440*	172	0	98	74	0 (-100%)	147	25	100 (-33%)	47	25	172 (+15%)	0	0	150	34	0
11	Beck Ranch, Inc.	1813	287	0	287	-	46 (-82%)	241	-	227 (-12%)	60	-	287 (+12%)	0	-	257	31	-
	Continuous Season																	
12	Ericson, David	2809	284	0	267	17	32 (-89%)	246	6	224 (-26%)	54	6	284 (-06%)	0	0	301	125	0
13	Farnam	160	23	0	23	-	5 (-84%)	18	-	17 (-47%)	6	-	23 (-28%)	0	-	32	0	-
14	Hadan Livestock	2328	160	0	160	-	13 (-94%)	147	-	84 (-62%)	76	-	160 (-28%)	0	-	221	22	-
15	Johnson Stock Co.	2529	374	0	374	-	69 (-89%)	305	-	320 (-49%)	54	-	374 (-41%)	0	-	632	0	-
16	Langer	2197	289	0	289	-	54 (-88%)	235	-	204 (-54%)	85	-	289 (-34%)	0	-	439	71	-
17	Moore	120	10	0	10	-	2 (-75%)	8	-	5 (-38%)	5	-	10 (+25%)	0	-	8	0	-
18	Parsons	1340	133	0	133	-	24 (-86%)	109	-	85 (-52%)	48	-	133 (-25%)	0	-	177	5	-
6b	Parsons/Robinson	720	83	0	83	-	1 (-99%)	82	-	48 (-64%)	35	-	83 (-37%)	0	-	132	26	-
8b	Porterfield Rch 2	965	110	0	110	-	1 (-99%)	109	-	70 (-60%)	40	-	110 (-37%)	0	-	175	0	-
19	Schader	1742	315	0	315	-	0 (-100%)	315	-	255 (+122%)	60	-	315 (+174%)	0	-	115	29	-
20	Sites	760	135	0	135	-	10 (-93%)	125	-	99 (-35%)	36	-	135 (-11%)	0	-	152	0	-
21	Smith	320	30	0	30	-	1 (-95%)	29	-	18 (-18%)	12	-	30 (+27%)	0	-	22	0	-
22	Sullivan	360	45	0	45	-	10 (-89%)	35	-	37 (-59%)	8	-	45 (-50%)	0	-	90	0	-
23	Taylor	1160	107	0	85	22	0 (-100%)	100	7	73 (-25%)	27	7	107 (+10%)	0	0	97	27	0
9b	Truax-Sheep Mtn.	600	112	0	112	-	6 (-94%)	106	-	94 (-14%)	18	-	112 (+03%)	0	-	109	10	-
	Rest Rotation																	
10b	Tablelands North	5774*	794	0	794	-	18 (-98%)	776	-	605 (-19%)	189	-	794 (+07%)	0	-	745	185	-
	TOTAL	37,595	4,799	0	4,235	564	388 (-93%)	4,219	192	3,418 (-37%)	1189	192	4,799 (-12%)	0	0	5,441	700	0

* Public land only. Does not include private land (600 acres South, 1160 acres North) also under allotment management plan (AMP).

** Treatments applicable only under moderate use and exclusive use alternatives, except for existing Tablelands AMPs which would also continue under No Action alternative. All allotments continuous seasonal under limited use alternative.

*** Zeros in the no action alternative columns indicate that there is presently no designated allocation for the allotment, but that forage is being consumed by big game or wild horses.

non-game wildlife, etc.) with emphasis on particular resources in some areas. Forage would be allocated for existing big game needs, with remaining available forage allocated to livestock and wild horses. A wild horse management plan would be developed to manage the herd at approximately sixteen horses until such time as their habitat can support a larger population commensurate with other consumer needs. Threatened archaeological sites would be protected from the consequences of the range management program. Range facilities and vegetation manipulation would be implemented.

Exclusive Use

General Use - The type or level of use would be so concentrated that other uses would be severely restricted or excluded. Examples may be surface mining, ORV open areas, or powerplant sites.

Specific Use - All forage in excess of non-consumptive needs would be allocated to livestock. Archaeological sites would be protected. Other uses not conflicting with livestock grazing would only be supported through grazing management. Big game would receive no forage allocation. Wild horses would be removed from the area.

No Action (Continue Present Grazing Management)

No changes in the levels of present grazing management would be made. Forage allocations for livestock would continue at the present levels. Wild horses would be maintained at their present estimated population of approximately 20.

Vegetation Availability And Use

Allocation Levels

Average annual forage production was determined on all public lands suitable for grazing (see Chapter 2, Vegetation-Available Forage Production). After reserving 50 percent of the annual forage production for plant health and vigor, watershed cover, aesthetics and general wildlife purposes, the remaining 50 percent was allocated for consumption by big game, wild horses and livestock under four of five alternative proposals. Forage allocation under the no action alternative exceeds 50 percent of the total annual forage production. The proportion of allocation for consumers is different for each of the five alternatives (Table 1-1).

Allocation Treatments

Allocations were made for livestock under four different treatments (using identification terminology of Lacey and Van Poollen, 1979): rest-seasonal grazing; deferred-seasonal grazing; continuous-seasonal grazing; and rest-rotation grazing.

Rest-seasonal grazing is an intensive, one pasture treatment allowing complete rest for one year after two consecutive years of spring grazing (Table 1-2). The treatment may be used when it:

-- Would improve appropriate native key species composition by providing complete scheduled rest from grazing, or

-- Would provide periodic rest from grazing to improve native grass release in areas designated for juniper control where there are sufficient native perennial grasses to take advantage of juniper canopy cover removal.

Deferred-seasonal grazing would provide for a portion of the allotment to be deferred from grazing until later in the season. The deferment may be scheduled to allow a portion of an allotment to reach the seedripe stage in alternating years or to allow plants to reach desired maturity in higher elevations of an allotment each year (Table 1-2). The treatment may be recommended when one or more of the following circumstances exist:

-- Range condition is capable of being maintained on an upward trend.

-- Grazing use is already on a deferred seasonal system and the range is being maintained in fair to good ecological condition and trend is upward.

-- Native key species composition would be improved by providing regularly scheduled rest from grazing during periods critical to the yearly growth cycle of plants.

-- Periodic deferred grazing would improve the effects of proposed juniper or brush manipulation and/or seeding projects by allowing desired species to complete their annual cycle without disruption.

Continuous-seasonal grazing would allow grazing of an entire allotment each year within a restricted period of time (Table 1-2). Seasonal grazing may be selected when a less intensive management system is needed to meet one or more of the following situations:

-- The allotment is a single fenced area of small size which could not be feasibly combined with a larger allotment.

-- The allotment consists of small, scattered land parcels intermingled with private land.

-- The only available water is located on adjacent private land and there is a low probability of developing water on the Federal lands.

-- There is little probability that management of the allotment for native perennial grasses would be successful.

-- The majority of the allotment is in fair to good ecological condition.

TABLE 1-2

GRAZING TREATMENT USE PATTERNS

THREE-YEAR PERIOD BY SEASON OR REST

TREATMENT	Year 1					Year 2					Year 3				
	Winter	Spring	Summer	Fall	Rest	Winter	Spring	Summer	Fall	Rest	Winter	Spring	Summer	Fall	Rest
Rest-Seasonal (one pasture)		A or A					A or A								A
Deferred-Seasonal (two pasture)		A		B			B					A		B	
	or	A	B				A	B				A	B		
Continuous-Seasonal (one pasture)		A or A					A or A					A or A			
Rest-Rotation (three pastures)		A		B	C		B		C	A		C		A	B

Letters A, B, and C represent pastures within one allotment under the treatment described.

-- Less than 100 AUMs of allocatable forage are available on the allotment.

-- The continuous-seasonal treatment takes advantage of existing range improvements.

A three-pasture rest-rotation grazing system under an established allotment management plan (AMP) treatment is presently in effect in the Mount Dome Unit. Under this system, one pasture is grazed in the spring, one is grazed in the fall, and the remaining one is rested year-long. Each pasture rotates through each status on a three-year cycle (Table 1-2). This treatment allows desirable forage species (bluebunch wheatgrass, Thurber's needlegrass, Idaho fescue and bitterbrush) to recover vigor, improve seedling establishment and build litter accumulation.

This rest-rotation treatment AMP would be recommended for retention under the moderate use, exclusive use, and no action alternatives because:

-- The ecological condition on the allotment has gone from poor to fair in 10 years under this treatment.

-- Treatment takes advantage of existing range facilities/treatments.

-- The treatment would protect vegetation used by wildlife during critical seasons.

Topographic barriers, pasture size and lack of available or potential water for each pasture prevent the establishment of other rest rotation AMPs in the Mount Dome Planning Unit.

Most allotments are presently under the continuous seasonal treatment. The only exceptions are the two existing Tablelands AMPs using deferred-seasonal and rest-rotation systems. Treatments other than continuous-seasonal grazing would only be applied under the moderate use, exclusive use, and no action (present situation) alternatives, as noted in Table 1-3.

TABLE 1-3
ALLOTMENT TREATMENT ACREAGE BY ALTERNATIVE

TYPE	PRIMITIVE USE	LIMITED USE	MODERATE USE	EXCLUSIVE USE	NO ACTION
Deferred Seasonal	0	0	9,250	9,250	1,440
Rest Seasonal	0	0	4,461	4,461	0
Rest Rotation	0	0	5,774	5,774	5,774
Continuous Seasonal	0	26,836	18,110	18,110	30,381
Total	0	26,836	37,595	37,595	37,595

Allotment management plans would be developed only for allotments using either the rest seasonal or deferred seasonal system.

Season of Use

Plant phenology studies were used to determine a season of livestock use which would provide maximum nutrition while also maintaining plant vigor and encouraging desired plant species. Seasonal availability of water for livestock sometimes limits possible seasonal choices. Season of use for consumers is shown in Table 1-4.

Range Projects

Vegetation Manipulations

Proposed vegetation manipulations on public grazing lands (Map 1-2) include prescribed burning, juniper bulldozing, juniper handfelling, and dead mahogany bucking (Tables 1-5 and 1-6). Prescribed burning and juniper bulldozing are seedbed preparations for rangeland drilling of perennial grasses on 980 acres, except under the limited use alternative when 390 acres would be burned but not seeded. Prescribed burning is proposed on dense rabbitbrush to carry fire through young (10-15 year old) invading juniper and not specifically to eliminate the rabbitbrush which is a post-fire resprouter. In proposed juniper bulldozing areas (590 acres) strips of standing trees, not to exceed 10 percent of the area would be left. The areas to be seeded vary from level to 4 percent slope. Commercial fertilizer would be applied after seedlings are established.

Juniper chainsaw thinning is proposed on 1,700 acres to release perennial understory plants with minimal disturbance of the understory vegetation and soil mantle. The juniper would be placed on the ground horizontal to the sideslope to minimize erosion.

Dead mahogany bucking on 600 acres would open additional areas to livestock use.

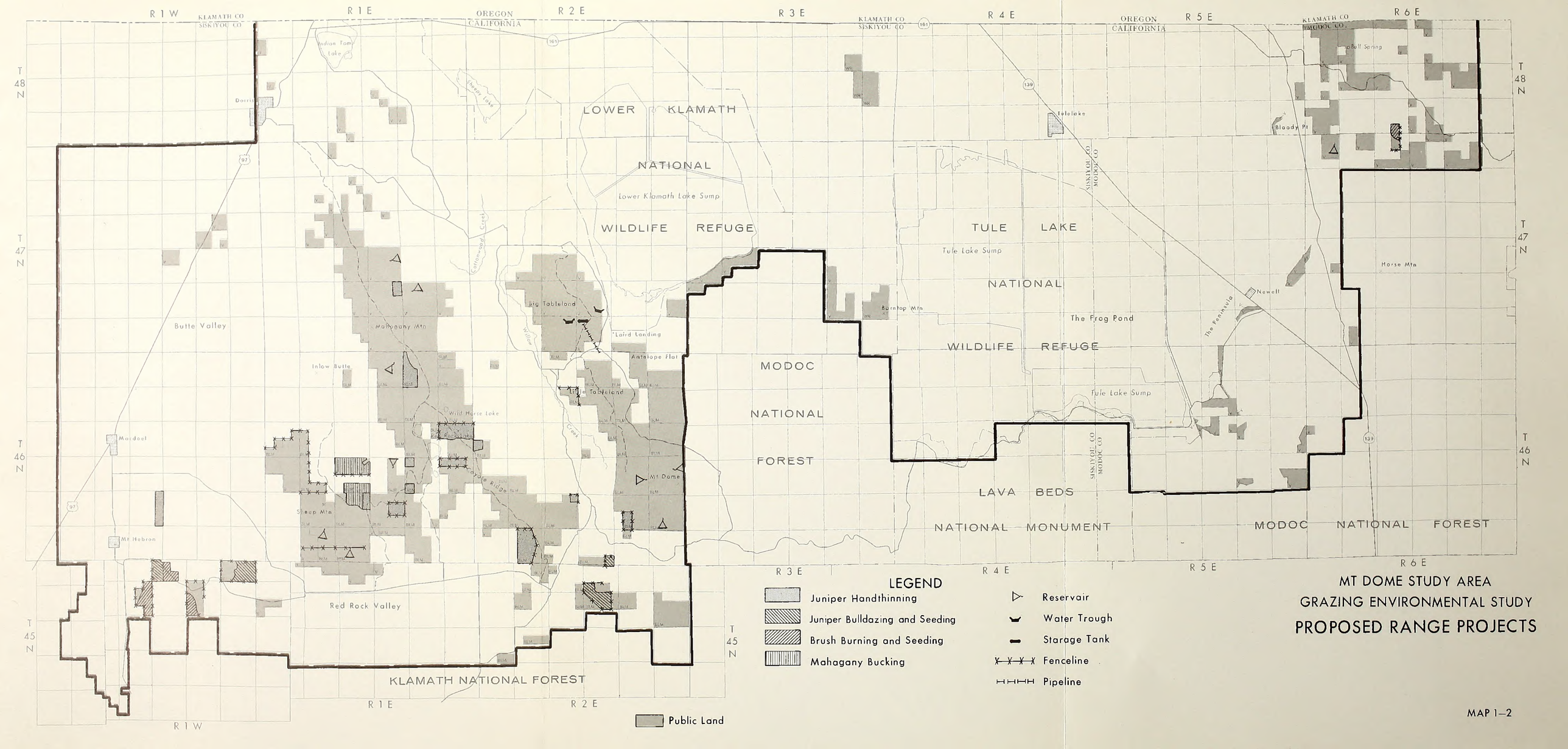
Range Facilities

Under the moderate use and exclusive use alternatives, 30 miles of fencing would allow uniform grazing of allotments, control of livestock use, protection of aquatic vegetation, and protection of vegetation manipulation areas until they are mature for grazing. Under the primitive use alternative, 104 miles of fence would be constructed to exclude all livestock. An additional 1¼ to 2¼ miles of fence would be placed to protect archaeological sites under each alternative. Antelope-compatible fencing would be constructed when appropriate. The proposed fenceline would be cleared by hand labor. Lakeshore protective fences would provide limited access for big game, wildhorse, and livestock water consumption.

TABLE 1-4
CONSUMER SEASON OF USE BY ALLOTMENT

Map Key No.	Allotments By Grazing Treatment	Allotment Acreage	Livestock Season of Use and Kind (Cattle-C or Sheep-S) For All Applicable Alternatives		Wild Horse Herd Use	Antelope Season Of Use	Winter Deer Herd Season Of Use
	Rest Seasonal						
1	Ericson, Don	1279	05/01-07/31	C	1/1-12/31	-	11/15 - 4/15 (all allotments)
2	Johnson, Stanley	559	05/01-07/31*	C	-	-	
3	Johnson/Dalton/Hal.	77	05/01-07/31*	C	-	-	
4	Loveness Lumber	685	05/01-07/31	C	-	-	
5	Orahood	439	05/01-07/31	C	1/1-12/31	-	
6a	Parsons/Robinson	1422	04/15-07/02	C	-	-	
	Deferred Seasonal						
7	Criss, Wayne	452	05/01-07/31	C	-	3/1-7/1	
8a	Porterfield Rch 1	4699	05/15-08/15	C	1/1-12/31	-	
9a	Truax-Red Rock	846	04/15-07/15	C	-	3/1-7/1	
10a	Tablelands South	1440	To comply with AMP in effect		1/1-12/31	-	
11	Beck Ranch, Inc.	1813	04/15-05/15	C	-	-	
			05/16-06/17	C	-	-	
	Continuous Season						
12	Ericson, David	2809	05/01-09/15	C	1/1-12/31	-	
13	Farnam	160	05/01-09/15	C	-	-	
14	Hadan Livestock	2328	11/15-12/15	C	-	-	
15	Johnson Stock Co.	2529	05/01-07/31*	C	-	-	
16	Langer	2197	04/15-06/30	S	-	-	
17	Moore	120	05/15-06/30	C	-	-	
18	Parsons	1340	04/15-07/15	C	-	-	
6a	Parsons/Robinson	720	04/15-06/30	C	-	-	
8b	Porterfield Rch 2	965	04/15-06/30	C	-	5/15-7/15	
19	Schader	1742	04/15-07/15	C	-	-	
20	Sites	760	04/01-06/17	S	-	-	
21	Smith	320	05/01-06/15	C	-	-	
22	Sullivan	360	05/01-07/31	C	-	-	
23	Taylor	1160	04/15-06/30	C	1/1-12/31	-	
9b	Truax-Sheep Mtn.	600	04/15-07/30	C	- -	-	
	Rest Rotation						
10b	Tablelands North	5774	To comply with AMP in effect		-	5/15-7/15	
	TOTAL	37,595					

* Season may vary to complement use of operator's adjacent land.



MT DOME STUDY AREA
GRAZING ENVIRONMENTAL STUDY
PROPOSED RANGE PROJECTS

MAP 1–2

TABLE 1-5
ADDITIONAL PROJECTS AND THEIR COSTS [1/] FOR EACH ALTERNATIVE

PROJECTS (units of measure)	PROPOSED ALTERNATIVES									
	Primitive Use (units-cost)		Limited Use (units-cost)		Moderate Use (preferred) (units-cost)		Exclusive Use (units-cost)		No Action (units-cost)	
Vegetation Manipulation										
Prescribed Burn for Seeding (acres)	-	-	390	$ 500	390	$ 500	390	$ 500	-	-
Juniper Bulldozing for Seeding (acres)	-	-			590	28,400	590	28,400	-	-
Juniper Handfelling (acres)	-	-	1,700	137,000	1,700	137,000	1,700	137,000	-	-
Dead Mahogany Bucking (acres)	-	-	600	108,000	600	108,000	600	108,000	-	-
Seed Drilling (acres)	-	-			980	17,600	980	17,600	-	-
Facilities										
Fences (miles)	104	260,000	1.25	3,125	32.5	81,250	32.5	81,250	-	-
Reservoirs (number)	-	-	10	25,000	10	25,000	10	25,000	-	-
Pipeline (miles)	-	-	1.5	19,000	1.5	19,000	1.5	19,000	-	-
Storage Tank, Troughs, Misc. & Installation	-	-	1	15,000	1	15,000	1	15,000	-	-
TOTAL		260,000		307,625		421,750		431,750	0	0

[1/] All costs expressed in 1979 dollars.

TABLE 1-6
PROPOSED RANGE FACILITIES AND VEGETATION MANIPULATION FOR MODERATE USE ALTERNATIVE BY ALLOTMENT

Map By No.	Allotments By Grazing Treatment	Allotment Acreage	VEGETATIVE MANIPULATION: Felling Juniper (Acres)	Bulldozing & Seeding (Acres)	Prescribed Burn & Seeding (Acres)	Dead Mahogany Bucking (Downed) (Acres)	PHYSICAL IMPROVEMENTS: Protective Fence (Miles)	Reservoirs	Water Pipeline Tank W/Troughs (Miles)
	Rest Seasonal								
1	Ericson, Don	1279	150				2.5*	1	
2	Johnson, Stanley	559							
6a	Parsons/Robinson	1422		300			2.5*		
	Deferred Seasonal								
7	Criss, Wayne	452		100	270		3.0		
8a	Porterfield Rch 1	4699	485				4.0*	2	
9a	Truax-Red Rock	846		190	80		5.0		
10a	Tablelands South	1440	120				1.75		
11	Beck Ranch, Inc.	1813					2.0	2	
	Continuous Season								
12	Ericson, David	2809	200			600	1.5**	2	
13	Farnam	160	160						
14	Hadan Livestock	2328	80				1.0	2	
15	Johnson Stock Co.	2529			40		1.0	1	
16	Langer	2197							
18	Parsons	1340	135				1.0		
6a	Parsons/Robinson	720						1	
19	Schader	1742	290				1.5		
23	Taylor	1160	80						
9b	Truax-Sheep Mtn.	600					1.0		
	Rest Rotation								
10b	Tablelands North	5774						1	1.5
	Unleased Areas						5.0		
	Total		1,700	590	390	600	32.75	12	1.5

* Includes 1 mile of archaeology site fencing
** Includes 0.5 mile of archaeology site fencing

Under limited, moderate, and exclusive uses, 10 reservoirs would provide water and facilitate more even forage utilization over larger areas. Areas disturbed during reservoir construction would be seeded. A pipeline would be constructed from an existing private well to provide a more dependable source of water on the existing Tablelands AMP, especially during treatments in fall seasons. The pipeline would control treatments and associated forage consumption without a dependency on inconsistent rainfall for recharging reservoirs.

Implementation

Implementation Schedule

A final decision by the Redding BLM District Manager on the Mount Dome Grazing Management Plan is anticipated approximately one month after the final EIS is filed. The present schedule would place this date at about February 1981. Management and activity plans would be developed as required to implement the decision. AMPs would be developed in cooperation with operators in Fiscal Year 1982. Wild horse and wildlife habitat management plans (HMPs) and fire activity plans would also be developed then. Adjustments in stocking rates would be made proportionally in 1982, 1983, and 1984. Range projects would be implemented in 1983-85.

Standard Implementation Procedures

Implementation of any of the array of alternatives, described above on Bureau-administered lands, would be constrained by the following to avoid or minimize impacts that could occur on other resources:

1. Permanent roads or trails will not be constructed to project sites. Existing access and off-road vehicles will only be used where needed.

2. An endangered or threatened species clearance will be required before any part of the proposal that may affect any State or federally listed plant or animal or its habitat is implemented. If needed, formal consultation with the U.S. Fish and Wildlife Service will be initiated. If any part of the proposal will have a negative impact on an endangered or threatened species or its habitat, the project will be modified or abandoned.

3. In accordance with BLM policy, an archaeological evaluation is required for all project sites or actions prior to implementation. If cultural values are discovered, mitigation will comply with historic preservation legislation and Bureau policy. The BLM, following compliance with Section 106 of the National Historic Preservation Act, will be the final authority on mitigating measures.

In addition to project-related surveys, inventories will be conducted on grazing areas as funding permits. These inventories would increase the original data base and provide for Section 106 compliance.

4. All actions will follow BLM procedures pertaining to visual resources (BLM Manual 8400). The contrast rating system will be used to evaluate impacts on form, line, color, and texture in the basic components of the visual landscape. This methodology is applied to identify those elements which require mitigation to meet visual resource management class objectives for the areas in which management activities are proposed.

5. All fences will be constructed to meet Bureau fence design specifications. "Antelope fence," with a smooth bottom wire a minimum of 16 inches above the ground, will be used on those allotments where antelope are present.

6. Soil disturbed by reservoir and pipeline construction will be reseeded with native and/or introduced species as soon as possible to replace ground cover on the sites.

Monitoring

Vegetation

Periodic adjustments of the decision (forage allocation, projects, etc.) may be necessary to achieve long-term management objectives. To relate vegetation response to management practices, five types of monitoring studies will be carried out: condition, trend, production, utilization and actual use.

Vegetation trend would be monitored on permanent transects by measuring changes in vegetation composition and frequency over a period of time. Changes in selected key plant species would show successional trends. Several species of plants have been identified as key species in determining range condition and trend. The species and their density vary throughout the public grazing lands in the EIS area. Although the actual utilization rate of these key species may vary considerably, the maximum anticipated percent utilization of annual plant growth by weight would be as follows:

Bluebunch wheatgrass (*Agropryon spicatum*)	- 50%
Sandberg's bluegrass (*Poa sandbergii*)	- 40%
Idaho fescue (*Festuca idahoensis*)	- 50%
Needle and Thread (*Stipa comata*)	- 20%
Thurber's needlegrass (*Stipa thurberiana*)	- 50%
Bitterbrush (*Purshia tridentata*)	- 20%

Vegetation trend studies would be conducted every three years on rest-seasonal grazing and rest-rotation treatments on pastures under rest. On deferred-seasonal grazing treatments, trend would be measured the second and third year on the deferred pasture and then every two years thereafter. Continuous-seasonal treatments would be measured every two years.

The nine condition and trend plots on the existing Tablelands AMP would be continued.

Production and utilization on unseeded vegetation manipulation areas would be measured in circular plots on areas in which trend shows a significant change. Portable utilization cages would be placed on seedings, two per pasture, and clipped annually.

Ecological range condition would be determined by comparing the percent composition of each plant species by weight with existing applicable range site description.

Actual livestock use would be monitored by allotment counts. Additional reporting from the lessee would be required when stocking changes are made after the primary turnout date.

Key winter browse ranges (bitterbrush and mountain mahogany) would be sampled each spring by the permanent circular plot method. Condition, trend, and utilization would be determined on the plots.

If evaluation procedures determine that the condition and trend on an allotment, after five years under the initial decision within normal climatic ranges, shows no apparent change or is downward, components of the decision would be modified. Such modifications could include changes in the grazing treatment, livestock numbers, season of use, additional range developments, or any combination, to attain the management objectives. Modifications would require preparation of an environmental assessment or a supplement to this environmental impact statement before significant change could be implemented. In addition, if monitoring studies show that major stocking adjustments are necessary, those adjustments would be made whenever such a situation has been identified and documented. The BLM Area Manager would make temporary adjustments in the grazing systems during periods of drought or other emergencies when such adjustments would be in the interest of accomplishing management objectives.

Animals

Annual age and sex ratio monitoring would determine the population dynamics of the Red Rock horse herd. The information would be necessary to make a population and age structure analysis to guide future management decisions and development of a herd management plan. For comparable results, census observations would be collected for the same month in consecutive years during summer or late fall. Forage production, utilization, condition and trend would be monitored by the same methods used on livestock allotments.

Cultural Resources

The monitoring of presently known National Register quality sites requires that six cultural sites be visited throughout the planning unit, and

that objectively measureable criteria of disturbance be established within each. Photo plots would be permanently established to compare the condition of each site at the end of each grazing season with the original (1980) condition. Nearest-neighbor analysis would be performed to render indices of spatial displacement. Response to the monitoring program would require site-specific management adjustments where annual displacement indices (gross displacement divided by frequency of grazing season) equal a statistical significance at the .01 level.

SUMMARY COMPARISON OF IMPACTS OF ALTERNATIVES

A summary of the anticipated environmental impacts of each of the alternatives may be found in Table 1-7. A more detailed analysis of the impacts may be found in Chapter 3.

TABLE 1-7

IMPACT SUMMARY (LONG TERM-20 YEARS)

ENVIRONMENTAL ELEMENT	PRESENT SITUATION	MODERATE USE (PREFERRED)	NO ACTION	PRIMITIVE USE	LIMITED USE	EXCLUSIVE USE
VEGETATION ECOLOGICAL CONDITION (ACRES)						
Poor	10,252	440	15,358	2,969	1,420	7,723
Fair	17,374	8,832	7,677	7,434	8,832	18,772
Good	1,760	18,913	6,130	18,293	18,620	1,911
Excellent	0	221	221	690	514	0
RANGE TREND (ACRES)						
Declining	12,534	0	12,534	0	0	0
Stable	10,181	440	10,181	3,120	1,420	26,706
Improving	6,671	27,966	6,671	26,266	27,966	1,700
SEEDINGS (ACRES)	1,022	2,002	1,022	1,022	1,022	2,002
ALLOCATABLE FORAGE PRODUCTION (AUMs) (50% of Annual Growth)	4,799	7,294	4,579	7,047	7,229	5,039
LIVESTOCK GRAZING						
AUMs ALLOCATED	5,441	3,418	5,441	0	388	4,799
WILD HORSES						
HERD SIZE	Approx. 20	Approx. 16	20	Approx. 47	Approx. 16	0
AUMs ALLOCATED	0	192	0	564	192	0
HABITAT CONDITION	POOR	POOR TO FAIR	POOR (DECLINING)	POOR	FAIR TO POOR	NOT APPLICABLE
BIG GAME						
HABITAT CONDITION	POOR TO FAIR	SLIGHT IMPROVEMENT	NO CHANGE	SLIGHT IMPROVEMENT	SLIGHT IMPROVEMENT	NO CHANGE
AUMs ALLOCATED	700	1,189	700	4,235	4,219	0
CULTURAL RESOURCES	DEGRADATION THROUGH NATURAL CAUSES, LIVESTOCK TRAMPLING, WILD HORSE TRAILS, VANDALISM AND LOCAL RELIC HUNTERS	REDUCED DEGRADATION FROM LIVESTOCK AND WILD HORSES	CONTINUATION OF PRESENT SITUATION	REDUCED DEGRADATION FROM LIVESTOCK. INCREASED DUE TO WILD HORSES	LEAST DEGRADATION OF ALL ALTERNATIVES	REDUCED DEGRADATION DUE TO REMOVAL OF WILD HORSES. OTHER LOSSES SAME AS NO ACTION

TABLE 1-7 (cont.)

ENVIRONMENTAL ELEMENT	PRESENT SITUATION	MODERATE USE (PREFERRED)	NO ACTION	PRIMITIVE USE	LIMITED USE	EXCLUSIVE USE
VISUAL RESOURCES		SHORT-TERM DEGRADATION DUE TO CONSTRUCTION AND VEGETATION MANIPULATION	INSIGNIFICANT	INSIGNIFICANT	SAME AS MODERATE USE	SAME AS MODERATE USE
SOIL EROSION	VERY LOW EROSION RATES	INSIGNIFICANT	INSIGNIFICANT	INSIGNIFICANT	INSIGNIFICANT	INSIGNIFICANT
WATER						
RUNOFF	MODERATE	INSIGNIFICANT	INSIGNIFICANT	INSIGNIFICANT	INSIGNIFICANT	INSIGNIFICANT
QUALITY	GOOD	INSIGNIFICANT	INSIGNIFICANT	INSIGNIFICANT	INSIGNIFICANT	INSIGNIFICANT
SEASONAL AVAILABILITY	POOR IN LATE SUMMER	SLIGHT IMPROVEMENT IN SUMMER	NO CHANGE	NO CHANGE	SLIGHT IMPROVEMENT IN SUMMER	SLIGHT IMPROVEMENT IN SUMMER
RECREATION	UNDEVELOPED AND LITTLE USED	INSIGNIFICANT	INSIGNIFICANT	INSIGNIFICANT	INSIGNIFICANT	INSIGNIFICANT
SOCIOECONOMICS						
INITIAL PERCENT CHANGE IN TOTAL FORAGE SUPPLY						
Small Cattle Operators		- 2%	0	-12%	-11%	+ 1%
Medium Cattle Operators		- 2%	0	- 8%	- 8%	0
Large Cattle Operators		- 1%	0	- 3%	- 3%	- 1%
Sheep Operators		- 4%	0	- 9%	- 8%	- 3%
INITIAL PERCENT CHANGE IN FORAGE FROM PUBLIC GRAZING LANDS.						
Small Cattle Operators		-20%	0	-100%	-92%	+7%
Medium Cattle Operators		-28%	0	-100%	-97%	0
Large Cattle Operators		-44%	0	-100%	-92%	-24%
Sheep Operators		-49%	0	-100%	-89%	-28%
INITIAL REDUCTION IN HEAD OF BEEF CATTLE PRODUCTION		165	0	459	427	56

CONSEQUENCES TO OPERATOR INCOME: Consequences to individual operator incomes will vary between alternatives and operators. Long and short term impacts on operator incomes are considered insignificant because of the low dependency on public lands.

DEVELOPMENT OF ALTERNATIVES

The BLM planning system uses resource inventories and analysis to determine existing and potential conflicts in land use. It also is used to develop alternative actions to minimize conflicts while developing resources on a multiple-use, sustained-yield basis. The alternatives examined in this EIS have been developed through the BLM planning process as it deals with the interrelationships of livestock grazing.

Multiple-Use Conflict Resolution

Table 1-8 demonstrates the conflict resolution for the alternative which has initially been identified as preferred.

Upon completion of the EIS, decisions related to one or a combination of alternatives will be made. Subsequently, on-the-ground activities will be implemented through these decisions (MFP III) and/or activity plans such as allotment management plans.

For additional details on the BLM planning system, one can refer to the Bureau Planning Manual and planning documents located in the Redding, California, BLM District Office.

TABLE 1-8 MULTIPLE USE CONFLICT RESOLUTION FOR PREFERRED ALTERNATIVE

MFP 1 Recommendation	Other MFP 1 Recommendations That Conflict with Those in First Column	MFP 2 Recommendations	Rationale for MFP 2 Recommendations/Decision	Trade-offs
Provide 4835 AUMs of forage for livestock grazing in the Mt. Dome Planning Unit	Provide 4314 AUMs for deer and antelope (assumes support of total deer population in Planning Unit)	Allocate forage as follows: Livestock 3526 AUMs Wildlife 1189 AUMs Wild Horses 84 AUMs	Forage allocated for deer and antelope is sufficient to provide for the winter and resident deer population and antelope on public grazing lands. These figures are based on California Department of Fish & Game estimates on population and herd distribution. Remaining 3004 AUMs needed are available on areas unsuitable to livestock and on private lands.	1309 AUMs would not be available for livestock use. 3125 AUMs for deer would not be allocated to supplement forage available outside of BLM livestock grazing areas.
	Allocate vegetation to meet consumptive and non-consumptive requirements of non-game species	No specific AUM allocation would be made	Needs of non-game species were recognized by allocating only half of available forage to big game and livestock. The other half was to meet plant, watershed, and non-game needs.	None.
	Provide 192 AUMs of forage for 16 wildhorses	Provide the AUMs needed for 16 horses	Approx. 20 wildhorses (240 AUMs) are presently using the range. To enhance vegetation condition and allow for improved wild horse habitat, their numbers would be reduced to 16.	48 AUMs would not be available for existing wildhorses and populations would be reduced to 16. No trade-offs with livestock.
	Manage land use to achieve a 20% to 50% vegetation cover	No specific AUM allocation would be made	Watershed needs were considered by allocating half of total available forage to livestock, horses and wildlife, half for non-game/watershed needs.	None.
	Defer grazing in antelope kidding areas until mid-June	Livestock grazing would be conducted in accordance with the approved AMP, basically mid-April to late May	Cattle use in kidding areas is quite dispersed and usually the cattle are off the range by mid-May. The majority of use by cattle is in the seedings of the big tablelands while antelope stay in areas not used by cattle.	Minor social interaction between livestock and antelope would continue.
	Limit vegetation conversion seedings of exotic grass species	Where possible native vegetation would be used	Most conversions would consist of juniper removal where possible and where available native grasses would receive first consideration.	Extensive use of exotic vegetation would be eliminated which could limite the alternatives for viable seed.
Fence to protect lakeshore vegetation but provide water gaps	Improve scenic quality of public lands thorugh elimination of visual intrusions. Remove fence around Red Rock Lake	Fence would be removed when recreation values are higher than those of lakeshore habitat.	The existing fence protects a fragile habitat.	Visual quality.

CHAPTER 2

DESCRIPTION OF THE AFFECTED ENVIRONMENT

This chapter concentrates on the environmental elements which would be notably affected by any of the alternatives or which are described in order to clarify why they would not be affected. The degree of detail in the description is related directly to the intensity of the anticipated environmental consequences. More specific details or information of general interest on the Mount Dome Planning Unit may be found in the references cited in the EIS.

GENERAL SETTING

Climate

Precipitation

Most of the public land in the Planning Unit is at elevations of 4,500 to 5,500 feet and has a mean annual precipitation range of 14 to 18 inches. The scattered parcels in Butte and Red Rock Valley are at elevations of 4,200 to 4,300 feet and have mean annual precipitation ranges from 9 to 12 inches. The Bryant Mountain parcels east of Tulelake are at 4,000 to 5,000 feet elevation and have a mean annual precipitation of 10 to 16 inches (Calif. Div. Water Resources, 1978).

Drought, less than 85 percent of the long-term average annual rainfall, was found to occur in this region in 10 years of a 28-year period (Ratliff and Reppert, 1964). Rainfall records for nearby Mount Hebron and Tulelake indicate drought in three of 12 recent years (1966-78). The most recent severe drought year was 1976-77 when rainfall was approximately 60 percent of average.

Some precipitation usually occurs every month of the year. The greatest amounts fall during November, December, and January and the least during July, August, and September. Snowfall averages 20-30 inches annually. There are occasional localized heavy thunderstorms during the summer.

Temperature

The lowest monthly mean temperature in lower elevations of the area is approximately 29°F in January. The highest monthly mean temperature is approximately 68°F in August. The recorded extreme temperatures are a high of 103°F and a low of -27°F. The long winters leave a short, frost-free growing season of 80-115 days (U.S. Weather Bureau, 1965).

Air Quality

Total suspended particulates (TSP) were measured from 1970-78 at a Klamath Falls, Oregon, monitoring site. No long-term continuous monitoring is available from representative sites within the air basin of

the Mount Dome EIS area in California.

Air quality is good, with TSP at the Klamath Falls, Oregon, station exceeding national standards only 4-7 percent of the sampling period. California ambient air quality standard for a 24-hour sample is 100 mg/m^3. Fine windblown soils from fallow fields and agricultural burning account for some problems. Problems related to TSP usually occur during periods of instability, which last 12-18 hours.

Geology

The Mount Dome Planning Unit lies wholly within the Modoc Lava Plateau geomorphic province. The area has no recent faulting (younger than 200 years) and landslides and earthquakes are a minor problem. Sedimentary deposits on public lands are localized and cover less than 2,000 acres.

Less than 20 acres of these sedimentary areas are likely to have fossils of any significant scientific interest. Diatomite occurs at or close to the surface near the Tablelands and claims have been located and extensively explored on these.

The topography is dominated by the mountains and hills which rise above the surrounding Butte Valley and Lower Klamath/Tulelake basins (Map 2-1). Most public grazing lands are in these mountains.

Steeper areas on public lands include the western scarp of Mahogany Mountain, the east side of Sheep Mountain, the eastside of Coyote Ridge, the margins of the Tablelands, much of the higher elevations of Mount Dome, and the west scarp of the Bryant Mountain foothills. Slopes of 50 percent or more cover less than 15 percent of the total surface of the public grazing lands. Average slopes in the public grazing lands are 15-20 percent.

VEGETATION

Data Base

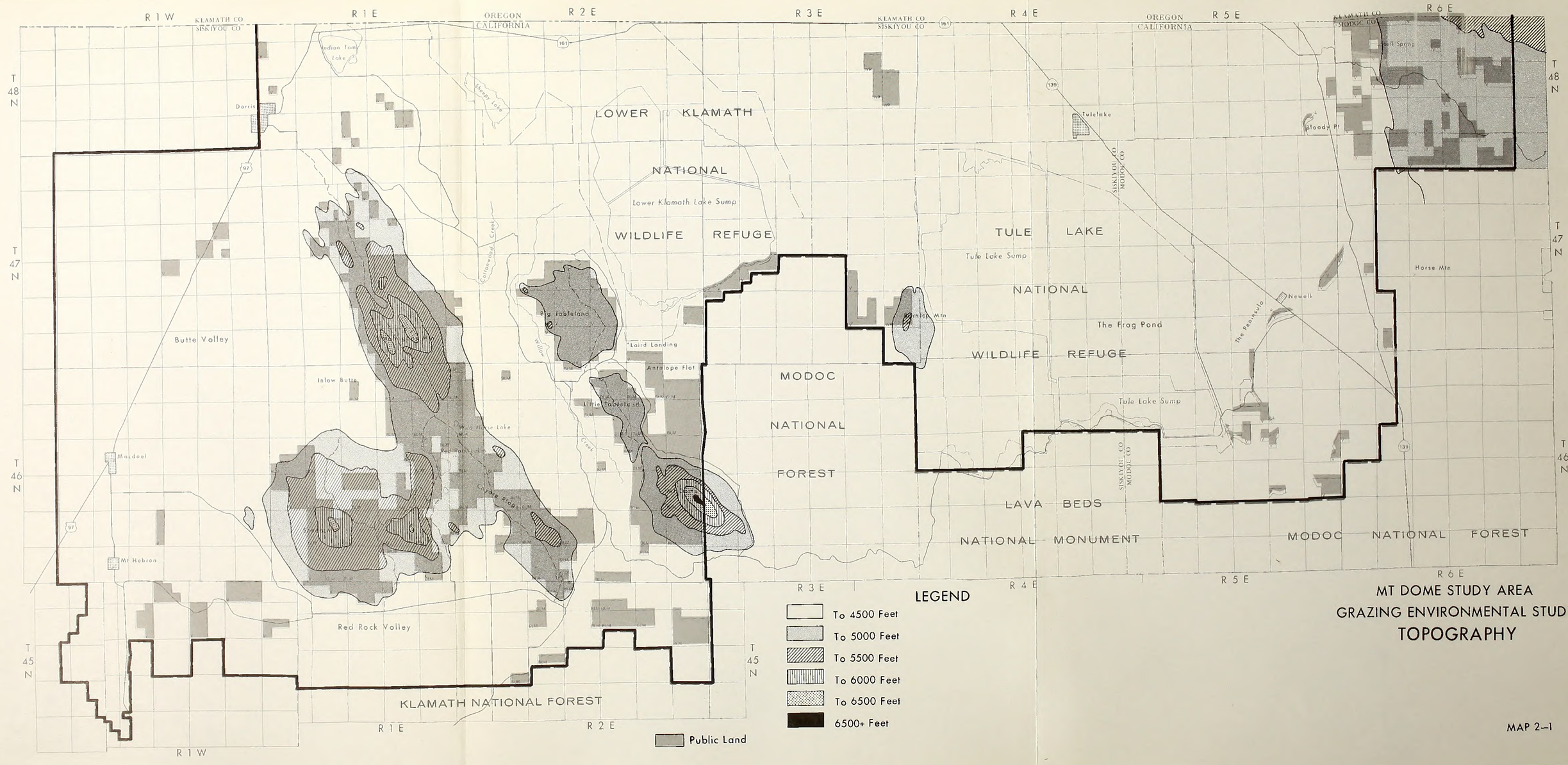
Information used in describing the vegetation that would be affected by the alternatives comes from:

Photo condition and trend studies conducted since 1968 on 7,134 acres of the Tablelands Allotment;

A 1978 vegetation inventory conducted by BLM on lands administered in the Mount Dome Planning Unit.

Photographs of the Mount Dome area taken about 1900.

Individual range site guides prepared by the Soil Conservation Service in 1978 for eight ecological sites (USDA, SCS 1978,) as shown in Appendix C.



MT DOME STUDY AREA
GRAZING ENVIRONMENTAL STUDY
TOPOGRAPHY

MAP 2–1

Vegetation Types

The vegetation on the EIS public grazing lands varies from isolated pine stands to relatively homogeneous sagebrush stands (Map 2-2). Juniper-steppe woodland (including juniper woodland and juniper savanna types) covers the major portion of the unit. This association is composed of western juniper with an associated understory of grass and mountain shrub species. Photograph comparison since about 1900 shows that juniper density has significantly increased in the Mount Dome region.

It is assumed that wildfires prior to the turn of the century controlled juniper density. The former fire climax sagebrush and perennial grassland communities are now dominated by juniper which has invaded or increased to its present density.

The EIS public grazing lands have five major vegetation types: juniper woodland, juniper savanna, sagebrush, mountain shrub, and grass-sedge. Each vegetation type is based upon significant differences in the proportions and kinds of native plant species that are predominant over an area. Vegetation types were determined from a 1978 vegetation inventory. Plants commonly found in these five types are listed in Table 2-1.

Juniper Woodland

The juniper woodland type dominates 13,534 acres (36 percent) of the public grazing lands. In this type, juniper canopy exceeds 10 percent. The average understory composition is 50-60 percent grass, 25-30 percent shrubs, and 15-20 percent forbs. The major understory species are sagebrush, Idaho fescue, and bluebunch wheatgrass. Increment core boring (BLM, 1978) found that the majority of the juniper in this type is in the 60 year plus age group.

Juniper Savanna

The juniper savanna vegetation cover occupies 10,526 acres (28 percent) of the public grazing lands. The juniper savanna differs from the woodland juniper plant community in that it has less than 10 percent juniper overstory. Increment core boring (BLM, 1978) found that the majority of the junipers in this type is 15 to 30 years old.

The most common plant associations are juniper/big sage/bluebunch wheatgrass and juniper/low sage/Sandberg's bluegrass.

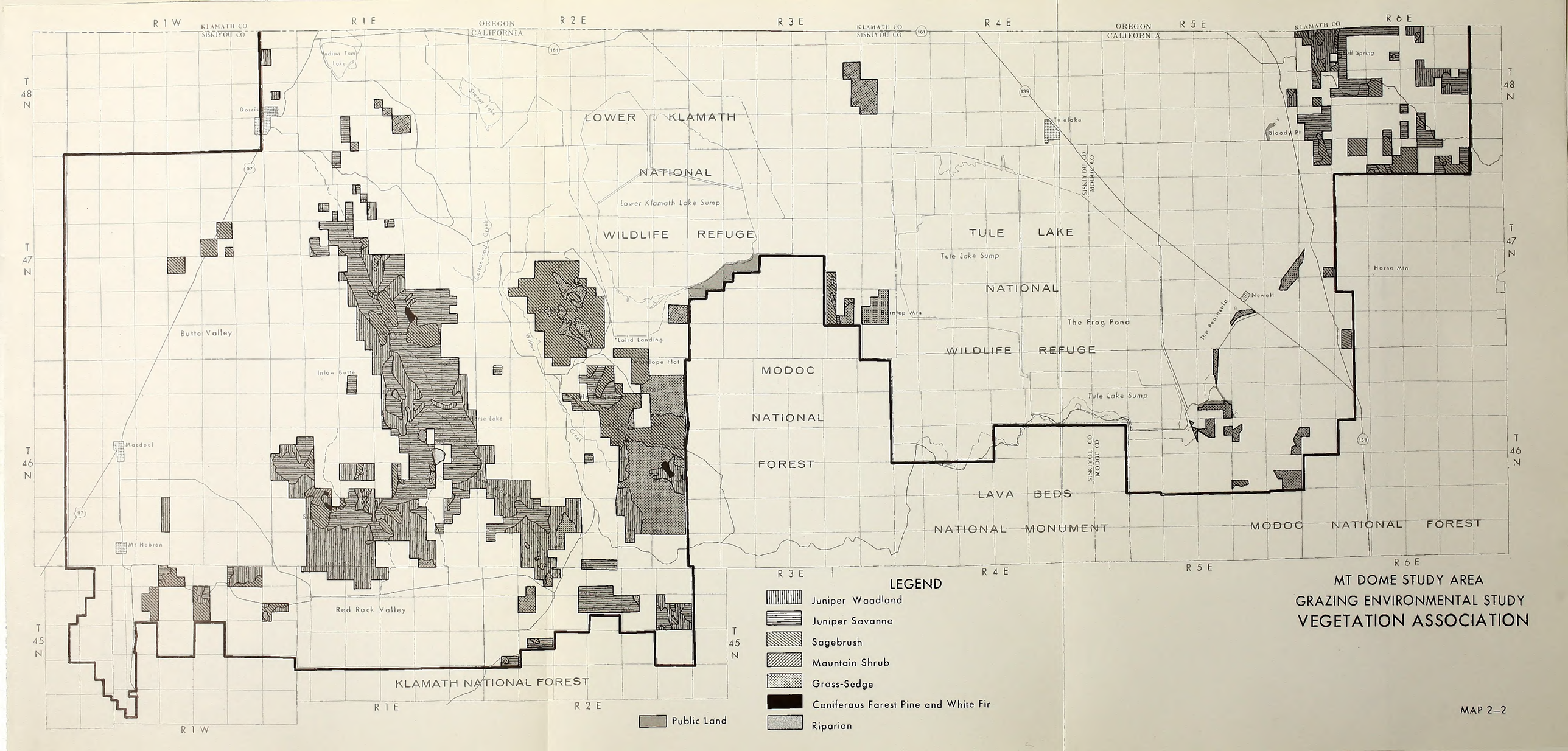
Sagebrush

Sagebrush covers 9,775 acres (26 percent) of the public grazing lands. Mountain big sagebrush is the most common species in the sagebrush type. Other predominant species include low sagebrush and silver sage. The rabbitbrush subtype is included in the sagebrush type and consists mainly of rubber and green rabbitbrush.

TABLE 2-1

SOME COMMON PLANTS OF THE MAJOR VEGETATION TYPES

TYPE	GRASSES	FORBS	SHRUBS
Juniper Woodland (36% 13,534 acres)	Idaho Fescue Sandberg's Bluegrass Bluebunch Wheatgrass Thurber's Needlegrass Bottlebrush Squirreltail Cheatgrass	Rock Cress Vernal Whitlow-Grass Spring Gold Cusick Stickseed	Gray Rabbitbrush Curlleaf Mahogany Low Sagebrush Big Sagebrush Western Chokecherry Bitterbrush
Juniper Savanna (28% 10,526 acres)	Idaho Fescue Sandberg's Bluegrass Bluebunch Wheatgrass Needle-and-Thread Bottlebrush Squirreltail Cheatgrass	Spring Gold Vernal Whitlow-Grass Blue-eyed Mary Sweet Cicely	Low Sagebrush Big Sagebrush Gray Rabbitbrush Curlleaf Mahogany Green Rabbitbrush Western Chokecherry Bitterbrush Waxcurrent Bittercherry
Sagebrush (26% 9,775 acres)	Bluebunch Wheatgrass Sandberg's Bluegrass Idaho Fescue Desert Wheatgrass Bottlebrush Squirreltail Cheatgrass	Lupine Penstemon Buckwheat Povertyweed Phlox Woollypod milkvetch	Gray Rabbitbrush Green Rabbitbrush Gooseberry Gray horsebrush Low Sagebrush Big Sagebrush
Mt. Shrub (0.6% 226 acres)	Bottlebrush Squirreltail Idaho Fescue Cheatgrass	Phlox Lupine Yarrow Tumblemustard Obscure Cryptantha	Bitterbrush Curlleaf Mahogany Big Sagebrush Gooseberry Serviceberry
Grasses & Sedges (09.% 3,384 acres)	Sandberg's Bluegrass Intermediate Wheatgrass Bottlebrush Squirreltail Idaho Fescue Crested Wheatgrass Mat Muhly Slender Wheatgrass Cheatgrass Spikerush Elk Sedge	Shasta Aster Hawksbeard Blue-eyed Mary Storksbill Speedwell Fireweed	Big Sagebrush Gray Rabbitbrush Bitterbrush Silver Sage
Conifer (0.4% 150 acres)	Idaho fescue		Ponderosa Pine White fir


R1W
R1E
R2E
R3E
R4E
R5E
R6E
T 48 N
T 47 N
T 46 N
T 45 N
KLAMATH CO
SISKIYOU CO
OREGON
CALIFORNIA
MODOC CO
Indian Tom Lake
Sheepy Lake
Dorris
Butte Valley
Willow Creek
Collowogh Creek
LOWER KLAMATH
NATIONAL
Lower Klamath Lake Sump
WILDLIFE REFUGE
Laird Landing
Antelope Flat
Inlow Butte
Macdoel
Mt Hebron
Red Rock Valley
MODOC
NATIONAL
FOREST
KLAMATH NATIONAL FOREST
Tulelake
Bull Spring
Bloody Pt
TULE LAKE
Tule Lake Sump
NATIONAL
WILDLIFE REFUGE
Barnlop Mtn
The Frog Pond
The Peninsula
Newell
Horse Mtn
LAVA BEDS
NATIONAL MONUMENT
MODOC NATIONAL FOREST
Public Land
LEGEND
Juniper Woadland
Juniper Savanna
Sagebrush
Mauntain Shrub
Grass-Sedge
Caniferaus Farest Pine and White Fir
Riparian
MT DOME STUDY AREA
GRAZING ENVIRONMENTAL STUDY
VEGETATION ASSOCIATION
MAP 2–2

The major understory species are bluebunch wheatgrass and lupine. Other important grasses are Sandburg's bluegrass, needlegrass, and bottlebrush squirreltail.

Mountain Shrub

The mountain shrub vegetation type makes up 226 acres (0.6 percent) of the public grazing lands. Important species in this type are mountain mahogany, bitterbrush, and gooseberry.

Mountain mahogany is the largest subtype. Idaho fescue and native perennial forbs comprise the major components in the understory vegetation.

Grass - Sedge

Grass and grasslike vegetation covers 3,384 acres (9 percent) of the public grazing land. Thirty-nine percent of this grassland is annual and 61 percent is bunchgrasses. Crested and intermediate wheatgrass seedings occupy approximately 1,400 acres in the grassland type.

An aquatic sedge type is found on 111 acres, mainly around the shorelines of clay basin lakes. The majority of this type is found in four separate areas, the largest of which is 47 acres in size. Fifty-seven acres of this aquatic vegetation has been protected from grazing by fencing.

Conifer and Broadleaf

The conifer type makes up approximately 150 acres (0.5 percent) of the public grazing land. The two major stands are on the northeast slope of Mount Dome and on the north slope of Sheep Mountain. The main composition is a monotype of ponderosa pine with an understory of manzanita or a mixed composition of ponderosa pine and white fir. All conifer stands are at higher elevations and on steep rocky slopes which prevent livestock grazing. Seven acres of quaking aspen are on public lands. The aspen type is associated with talus rock slides which protect young aspen from grazing.

Riparian Vegetation

There are no perennial streams and associated riparian vegetation on the public lands in the Mount Dome Planning Unit. The closest points on public land to a perennial stream are approximately 200 yards to Willow Creek west of both the Big and Little Tablelands.

Vegetation Characteristics

Ecological Condition

Ecological condition is the present state of the vegetation on a site in relation to its natural potential. Ecological condition in the EIS area, by allotment, is presented in Table 2-2.

TABLE 2-2

PRESENT RANGE ECOLOGICAL CONDITION BASED ON SOIL POTENTIAL (IN ACRES)

ALLOTMENT	GOOD	FAIR	POOR	UNSUITABLE	SEEDINGS	FENCED WETLANDS	TOTAL
Ericson, Don	161	385	606	110		17	1279
Johnson, Stan		504	30	25			559
Johnson, Dalton, Halousek		15	27	35			77
Loveness Lumber		532	138	15			685
Orahood		434	5				439
Parsons & Robinson I	90	350	919	43	20		1422
Parsons & Robinson II		510		210			720
Criss			452				452
Porterfield Ranch I	74	3565	249	811			4699
Porterfield Ranch II			790	175			965
Truax	246	295	846	59			1446
Tablelands North	60	1604	1596	1859	595	60	5774
Tablelands South		1260	66	14			1440
Beck Ranches, Inc.		1783	30				1813
Ericson, David	251	635	276	1545	82	20	2809
Farnam			160				160
Hadan Livestock Co.		480	1036	812			2328
Johnson Stock Co.	103	1784	642				2529
Langer	571	638	589	399			2197
Moore			120				120
Parsons	189	356	308	482	5		1340
Schader		1208	312	11	211		1742
Sites		760					760
Smith			320				320
Sullivan		152	198	10			360
Taylor	15	124	437	475	109		1160
Total	1760	17,374	10,252	7090	1022	97	37,595
% of Leased Land	4	47	27	19	2.7	0.3	
% of Condition Class	5	60	35				

The total condition class ratings for the public grazing lands are:

Excellent	None
Good	1,760 acres (4% total area)
Fair	17,374 acres (47% total area)
Poor	10,252 acres (27% total area)
Unsuitable	7,090 acres (19% total area)
Seedings & Wetlands	1,119 acres (3% total area)
Total	37,595 acres

Apparent Ecological Trend

Trend is a determination of whether the plant community is improving, declining, or remaining stable in relation to natural potential (climax).

Three major plant species in the unit which indicate a decline in trend when they make up a large percentage of the composition are rabbitbrush (Chrysothamnus spp.), cheatgrass (Bromus tectorum), and tansy mustard (Descurainia spp.).

Vegetation trend in Table 2-3 was estimated by using the above indicator species versus the percent of native plant composition. Since 1968, photo trend studies have been conducted on 7,134 acres in the Tablelands AMP or approximately 18 percent of the grazing land in the unit. Trend in this area has been determined by use of these studies.

Available Forage Production

Available forage production includes the native palatable plants, domestic grassland seedings, and a portion of annual cheatgrass. Forage production on the public grazing lands is estimated at 9,598 cow AUMs or 9,598,000 pounds dry weight per year. Table 2-4 lists allocatable production (50% of available forage) by allotment per year. Appendix A shows the methodology used to determine forage production.

Suitability for Livestock Grazing

The criteria used to determine suitability were slope, distance to water and minimum forage production (32 acres per AUM). The most deteriorated range is 20 acres/AUM in some areas used by the Red Rock horse herd. Potentially suitable livestock range must have acceptable slope (less than 50%) and the possibility of reducing the distance to water to less than two miles. Unsuitable range includes those areas with slopes steeper than 50 percent or areas of rockland talus, lava flows, or cliff areas (see Appendix B for specific criteria for range suitability).

TABLE 2-3

PRESENT RANGE ECOLOGICAL TREND BY ALLOTMENT (IN ACRES)

ALLOTMENT	IMPROVING	DECLINING	STABLE	UNSUITABLE	SEEDINGS	FENCED WETLANDS	TOTAL
Ericson, Don	489	619	44	110		17	1279
Johnson, Stan		534		25			559
Johnson, Dalton, Halousek		42		35			77
Loveness Lumber	106	404	160	15			685
Orahood			439				439
Parsons & Robinson I		837	522	43	20		1422
Parsons & Robinson II			510	210			720
Criss		452					452
Porterfield Ranch I		1464	2424	811			4699
Porterfield Ranch II		390	400	175			965
Truax	600	444	343	59			1446
Tablelands North	1420	1277	563	1859	595	60	5774
Tablelands South	786	125	515	14			1440
Beck Ranches, Inc.	507	1181	125				1813
Ericson, David	415	307	440	1545	82	20	2809
Farnam		160					160
Hadan Livestock Co.		938	578	812			2328
Johnson Stock Co.	915	813	801				2529
Langer		592	846	399			2197
Moore			120				120
Parsons	85	716	52	482	5		1340
Schader	864	365	289	11	211		1742
Sites		400	360				760
Smith			320				320
Sullivan		135	215	10			360
Taylor	124	437	115	475	109		1160
Totals	6,311	12,632	10,181	7,090	1,022	97	37,595
% of Leased Land	17	34	27	19	2.7	0.3	
% of Trend Class	22	43	35				

TABLE 2-4

SOURCES OF ALLOCATABLE FORAGE

Map Key No.	Allotment Grazing Treatment	Range Site Native Plants AUMs	Cheat-grass AUMs	Domestic Seeding AUMs	Squirrel-tail Above 5% AUMs	Total AUMs
	Rest Seasonal					
1	Ericson, Don	119	9			128
2	Johnson, Stanley	71	15			86
3	Johnson/Dalton/Hal.	5	2			7
4	Loveness Lumber	83	13	32		128
5	Orahood	63	8			71
6a	Parsons/Robinson	128	18	19		165
	Deferred Seasonal					
7	Criss Bros.	30	10			40
8a	Porterfield Rch.I	597	36			633
9a	Truax-Red Rock	65	13			78
10a	Tablelands South	159	13			172
11	Beck Ranch Inc.	257	30			287
	Continuous Seasonal					
12	Ericson, David	220	13	51		284
13	Farnam, Roy & Doug	20	3			23
14	Hadan Livestock	130	30			160
15	Johnson Stock Co.	329	45			374
16	Langer	279	10			289
17	Moore	8	2			10
18	Parsons	119	2	12		133
6b	Parsons/Robinson	73	10			83
8b	Porterfield Rch.II	99	11			110
19	Schader	178	21	116		315
20	Sites	120	15			135
21	Smith	22	8			30
22	Sullivan	38	7			45
23	Taylor	47	5	55		107
9b	Truax-Sheep Mtn.	108	4			112
	Rest Rotation					
10b	Tableland North	297	64	338	95	794
	Total	3,664	417	623	95	4,799

Suitability ratings for the EIS area presently under lease are:

Suitable	30,025 acres (80% of total area)
Potentially suitable	383 acres (1% of total area)
Unsuitable	7,187 acres (19% of total area)
Total	37,595 acres

Threatened, Endangered, or Rare Plants

No federally listed threatened or endangered species or their habitat were identified on the public grazing lands. However, one candidate Federal species and two California Native Plant Society listed species are known or suspected to occur within the Mount Dome EIS area:

Galium glabrescens ssp. modocense--Modoc bedstraw

Status: Threatened Candidate (FWS, 1980), very rare, endangered in part, population vigor stable, endemic to California (CNPS, 1980).

Habitat: Gravelly slopes and under the edges of rocks.

Location: Approximately 1 mile east of a BLM parcel on Horse Mountain in the Modoc National Forest.

Penstemon cinicola--Ash beard tongue

Status: Rare, endangered in part, population vigor stable, not rare outside California (CNPS, 1980).

Habitat: Volcanic soils from 4,000 to 5,000 foot elevation in yellow pine forests.

Location: Approximately 12 air miles south-southwest of the Mount Dome Planning Unit at Medicine Lake on the Klamath National Forest. Potential habitat exists within the Mount Dome Planning Unit on both Sheep Mountain and Mount Dome.

Thelypodium brachycarpum--Short-podded thelypodium

Status: Species of concern (FWS, 1980), rare, endangered in part, population vigor stable, endemic to California (CNPS, 1980).

Habitat: Alluvial clays of river plains and lake basins from approximately 2,000 to 4,000 foot elevation.

Location: Laird Landing, approximately 5 air miles north of Mount Dome on private lands.

SOILS

Data Base

The soil inventory for the parcels west of Willow Creek was done by the Soil-Vegetation Survey in 1977. The inventory for the parcels east of Willow Creek, including the Bryant Mountain foothills, was an Order 3 Survey done by the Soil Conservation Service in 1978 (USDA, SCS, 1978). Soil acreage by mapping unit may be found in Appendix D.

Copies of the two soils maps and their accompanying legends, tables and texts are on file in the Redding District BLM Office.

Soil Characteristics

Most of the soils on public grazing lands within the Mount Dome Planning Unit are moderately deep (20 to 40 inches) over hard lava rock. All of them are medium textured and most have significant amounts of gravels, cobbles, or stones. Selected physical characteristics and interpretations of all of the soils are shown in Appendix E.

Most of the soils classify as Argixerolls, soils having relatively dark surface horizons and appreciably more clay in the subsoil than in the surface horizon. The next most extensive group is Haploxerolls. These are soils with relatively dark surface horizons and only weakly developed (slightly differentiated) subsoil horizons. Appendix F lists the full classification of all of the soils in the EIS area.

Soil erosion hazard ratings have been developed by the SCS to characterize the relative ease with which a given soil will erode if its vegetation cover is removed. These ratings are one of the intepretations shown in Appendix E.

Soil erosion is occurring in the Mount Dome Planning Unit. The rates of erosion, however, are not as great as they are in many areas of the West. Reasons for this include: (1) the hard lava rock underlying most of the area; (2) a relatively low total annual rainfall, about half of which falls as snow, and (3) a relatively high percentage of ground cover (all forms of vegetation, plus litter and/or rock pavements).

The amount of sediment being produced in the Mount Dome Planning Unit is also small. This is due first to the relatively low rates of erosion and second to the relative infrequency of intense summer thunder (convective) storms which move the eroded material into stream channels where it becomes sediment.

The rate and amounts of sediment being produced by the various mapping units have been calculated using the procedure developed by the Pacific Southwest Inter-agency Committee (PSIAC) (Appendix E-1). A description of the PSIAC procedure for determining sediment production rates may be found in BLM Manual 7317, Appendix 2 (.33B). Eighty-five percent of the

soils in the area produce less than 0.3 acre-foot of sediment annually per square mile.

Wind does not cause significant soil erosion on public grazing lands in the EIS area because there are very few acres of sandy soils and most soils have an adequate cover of either vegetation and/or gravels, cobbles, and stones.

WATER RESOURCES

Data Base

There are no quantity or quality monitoring records available for surface water adjacent to or affected by public lands within the Mount Dome EIS area. Water resources were not inventoried for quantity or quality on public grazing lands within the EIS area.

The primary source of information on ground-water quantity and quality in the Mount Dome EIS area is Geology and Ground-Water Features of the Butte Valley Region, Siskiyou County, California by P.R. Wood (U.S. Geol. Survey, WSP 1491, 1960). California Department of Water Resources ground-water basin supply reports and the "Klamath River Basin Water Quality Control Plan" provide additional ground-water information.

Water Resources

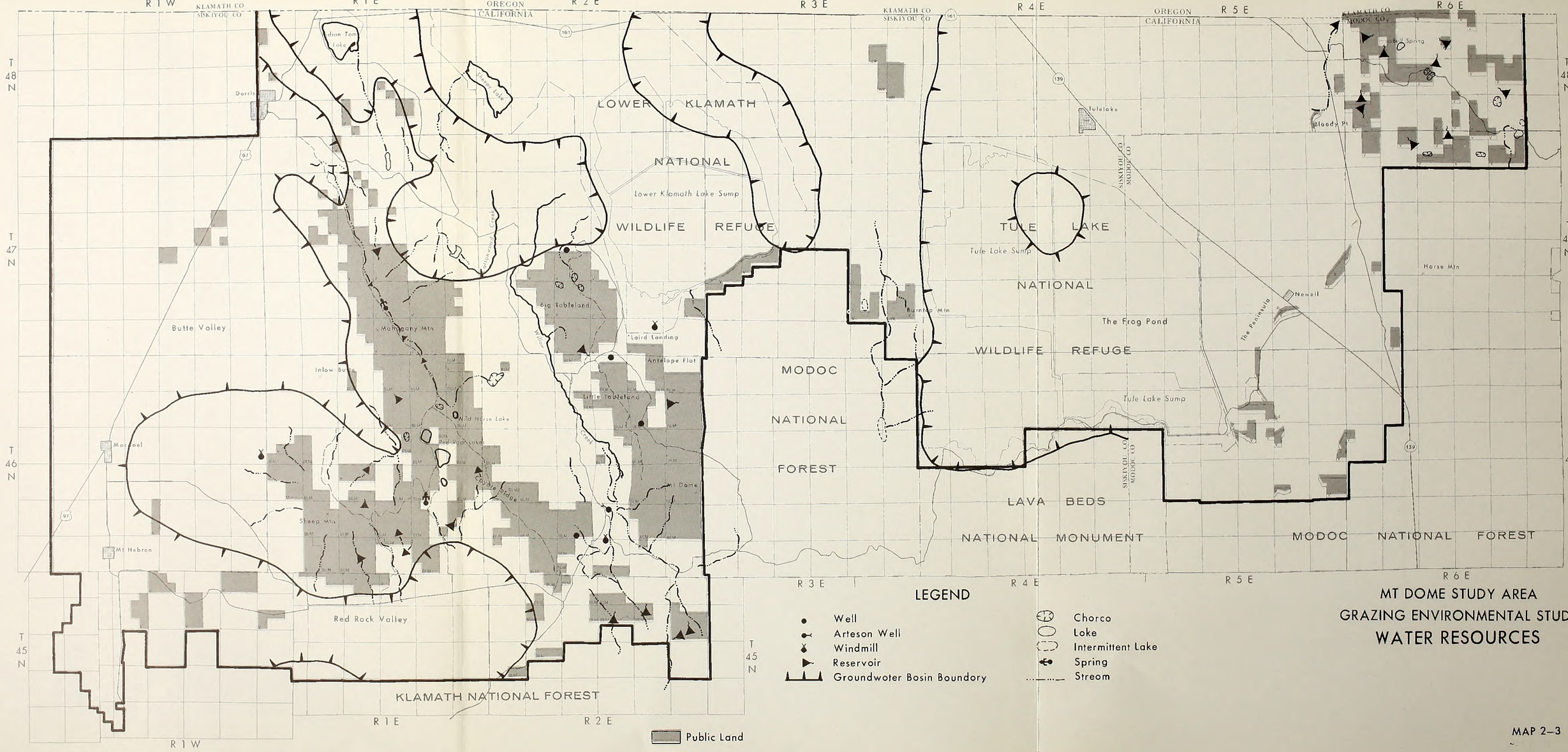
The Mount Dome EIS area is characterized by three lake basin watersheds: Lower Klamath, Tule, and Meiss Lakes. Surface water is scarce on public lands, with all sources either ephemeral or intermittent. The predominant ground-water resources are the Butte Valley and Red Rock Valley Basins (Map 2-3). Livestock, wild horses, and wildlife are the only consumptive users of the water resources on public land.

Surface Water

Surface flows result from snow melt and spring precipitation runoff. In the Mount Dome area, an estimated 4 percent of the precipitation results in surface runoff (King, 1971). The ephemeral drainages of the area supply some small stock-water reservoirs and provide ground-water recharge. Natural lakes include the Upper Middle and Lower Red Rock Lakes and Wild Horse Lake. Each varies greatly in size seasonally.

Water quality is considered good and calcium bicarbonate in character (Klamath River Basin Plan 1975). There is potential for bacteria pollution from livestock but there are no known water analyses on the public grazing lands. There are reports of algae growth during the summer months. The four natural lakes on public land are generally turbid because they are shallow.

The potential evaporation rate of 22.38 inches per year is characteristic of Great Basin desert land but considered low for most of California.



MT DOME STUDY AREA
GRAZING ENVIRONMENTAL STUDY
WATER RESOURCES

MAP 2–3

The actual evaporation of 9.99 inches per year (Calif. Land Capability Classification Guide, 1961) accounts for 65-100 percent of the precipitation per unit area.

Ground Water

Ground water is the principal source of water within the EIS area. The Butte Valley and Red Rock Valley Basins have the potential capacity of 75,000 acre-feet; 63,000 acre-feet presently are being pumped for domestic, irrigation, and municipal purposes (Calif. Dept. Water Resources, 1980). The water-bearing formations beneath public lands are volcanic and overlay lake deposits in the Tablelands area. The major sources of water are associated with the faulted tallus areas and sandy lake deposits. Yields from wells in Butte Valley and Red Rock Valley average an estimated 1,800 gallons per minute (Wood, 1961). Recharge to the basins and springs occurs at the higher elevations (Klamath River Basin Plan, 1975), which are primarily public lands.

The water from these basins is generally of excellent quality. The water is generally magnesium-sodium, magnesium-calcium, or sodium-magnesium bicarbonate in character, which accounts for its hardness. Recent Department of Water Resources investigations noted arsenic above recommended levels in wells near Dorris, California (Klamath River Basin Plan, 1978).

ANIMALS

Livestock

Twenty-four lessees use 27 allotments in the area. Twenty-two operators run cattle and two operators run sheep. Allotment boundaries are shown on Map 2-4. Cattle account for 92 percent of the livestock use. The current allocations and grazing seasons were established during a 1966 adjudication (Table 1-1, no action alternative). The cattle grazing season begins approximately April 15 at low elevations and May 15 at higher elevations. Sheep grazing takes place from April 1 to June 30. Range readiness studies (BLM, 1978) showed that, in most allotments, spring turnout dates determined in 1963 were appropriate to meet the phenological requirements of forage plants. Individual lessee livestock class and turnout dates are shown on Table 1-4.

The typical cattle operator runs a cow-calf operation. Cattle are usually turned into BLM allotments in the spring. Ten lessees move livestock onto National Forest lands for the summer seasons (Table 2-5). Some livestock graze on BLM allotments through the early summer. Calves are usually weaned and sold in late fall.

Sheep lamb in February or March. When lambs are old enough to travel, in April or May, they move to the BLM allotments and then to the National Forest lands for the summer season. In late fall the sheep are moved onto private lands where they remain until the next spring. In some

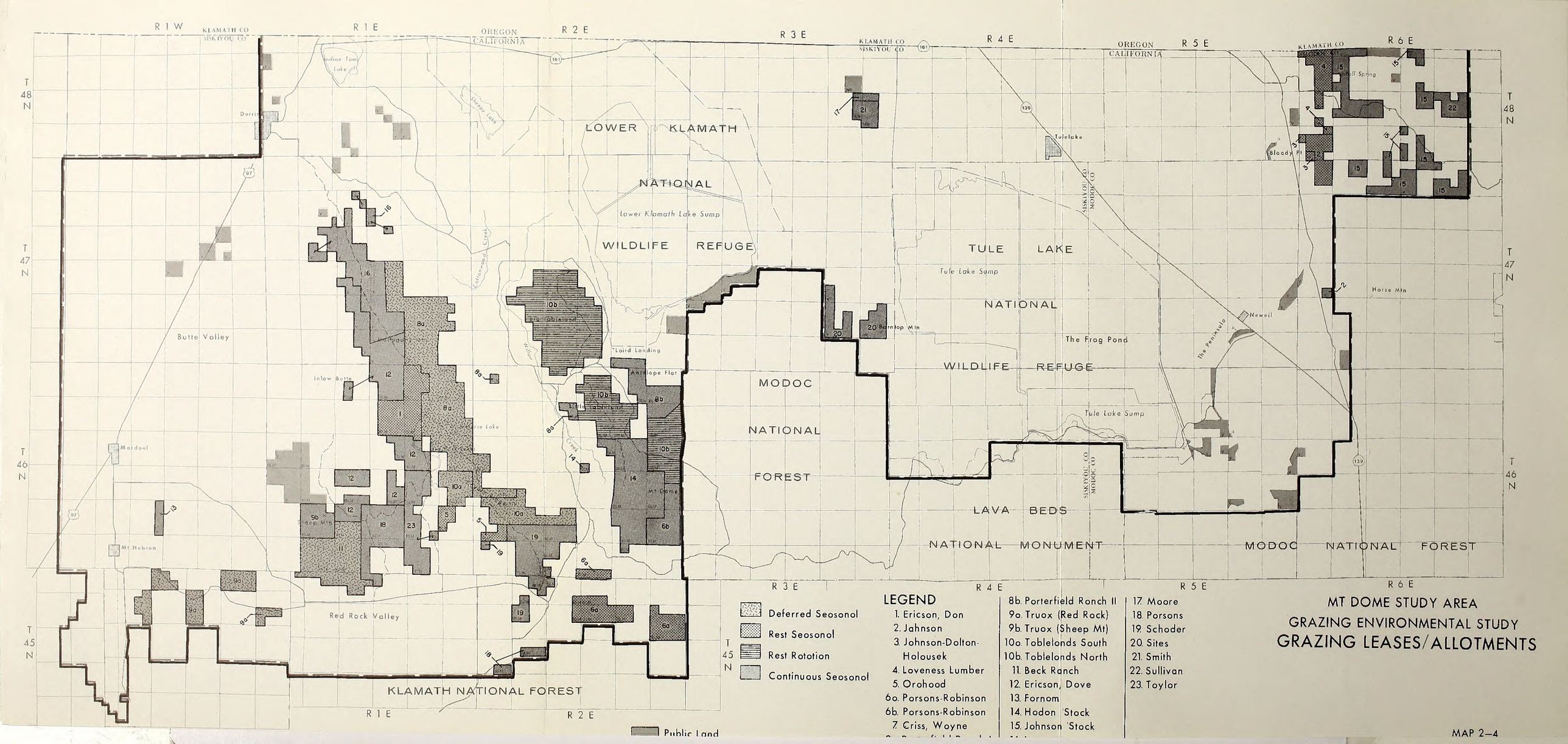
TABLE 2-5

OTHER FEDERAL LANDS USED BY MOUNT DOME GRAZING LESSEES

Lessee	Lakeview, OR-BLM			Klamath Nat'l Forest Goosenest Ranger Dist.			Modoc Nat'l Forest			N.F. ORE	
	Acres	AUMs	Season Of Use	Acres	AUMs	Season Of Use	Acres	AUMs	Season Of Use	AUMS	Season Of Use
Beck Ranch				11,700	1562	5/16-9/30					
Roy Farnam				6,847	80	6/1-9/30					
Johnson Stock Co.							48,627	1750	4/16-7/31		
							11,797	800	8/1-9/30		
Stan Johnson	31,475	2,760					60,424	1025	4/16-9/31		
Wm. O'Keeffe				20,640	973	6/1-9/15	11,091	875	5/1-7/15		
Lewis Parsons				28,707	1300	5/16-9/30					
H. Porterfield				5,126	351	6/1-8/30	6,888	200	4/16-6/13		
John Sites							14,045	125			
							21,723	1200	5/16-9/15		
John Truax				9,040	248	5/16-9/30					
P. Langer										2,700	6/1-10/1
Sub-Total	31,475	2,760		75,054	4514		174,545	5485			
Total (all other Federal lands)	281,124	15,459									

Sources - Personal communications with the following:

Dick Thompson, Range Conservationist, BLM, Lakeview, OR;
Chuck Neil, Range Conservationist, Klamath Nat'l Forest, Mt. Hebron, CA;
Ray Ward, Range Conservationist, Modoc Nat'l Forest, Alturas, CA.



MT DOME STUDY AREA
GRAZING ENVIRONMENTAL STUDY
GRAZING LEASES/ALLOTMENTS

MAP 2–4

years the Langer allotment provides sheep grazing for one fall month after returning from the National Forest lands.

Hay, grain, and pasture produced on private lands are used for winter feeding. Some ranchers produce more products than needed in normal winter operations and sell the excess as a cash crop. Nearly all of the grazed public lands in the EIS area are used by lessees who operate from private lands within or adjacent to the planning unit.

The public lands in the EIS area are well blocked and most boundaries are fenced, with the exception of 4,000 acres of scattered parcels in the eastern part of the area. Livestock control is not difficult in the EIS area.

The lack of perennial streams and springs and inefficiency of existing catchment reservoirs on BLM allotments limits dependable livestock water and presently hinders livestock distribution. In addition, unintegrated sources restrict ground-water development to scattered isolated areas. On the average in three out of every five years livestock are off the public rangeland by June due to lack of water.

Wild Horses

The Red Rock wild horse herd is the only wild herd located in the EIS area (Map 2-5). The general boundary of this herd covers approximately 6,830 acres, 80 percent of which is BLM-administered (Table 2-6). Other than local ranchers, very few people are aware that a wild horse herd exists in the area.

TABLE 2-6

Wild Horse Herd Management Area by Allotment

Allotment	BLM Acres	%	Private Acres	%
Porterfield Ranch 1	2,800	41	280	4
Ericson, Dave	230	3	120	2
Ericson, Don	1,279	19	0	0
Taylor	280	4	320	5
Orahood	140	2	280	4
Tablelands, South Unit	740	11	360	5
Total	5,469	80	1,360	20

Vegetation of special importance to the wild horse herd management area is identified in Appendix G. Juniper, although it reduces potential forage production, provides important shade in the summer and wind shelter in the winter for horses. Range condition class on the horse range is shown in Table 2-7.

TABLE 2-7

Wild Horse Range Condition Class on
BLM-Administered Lands

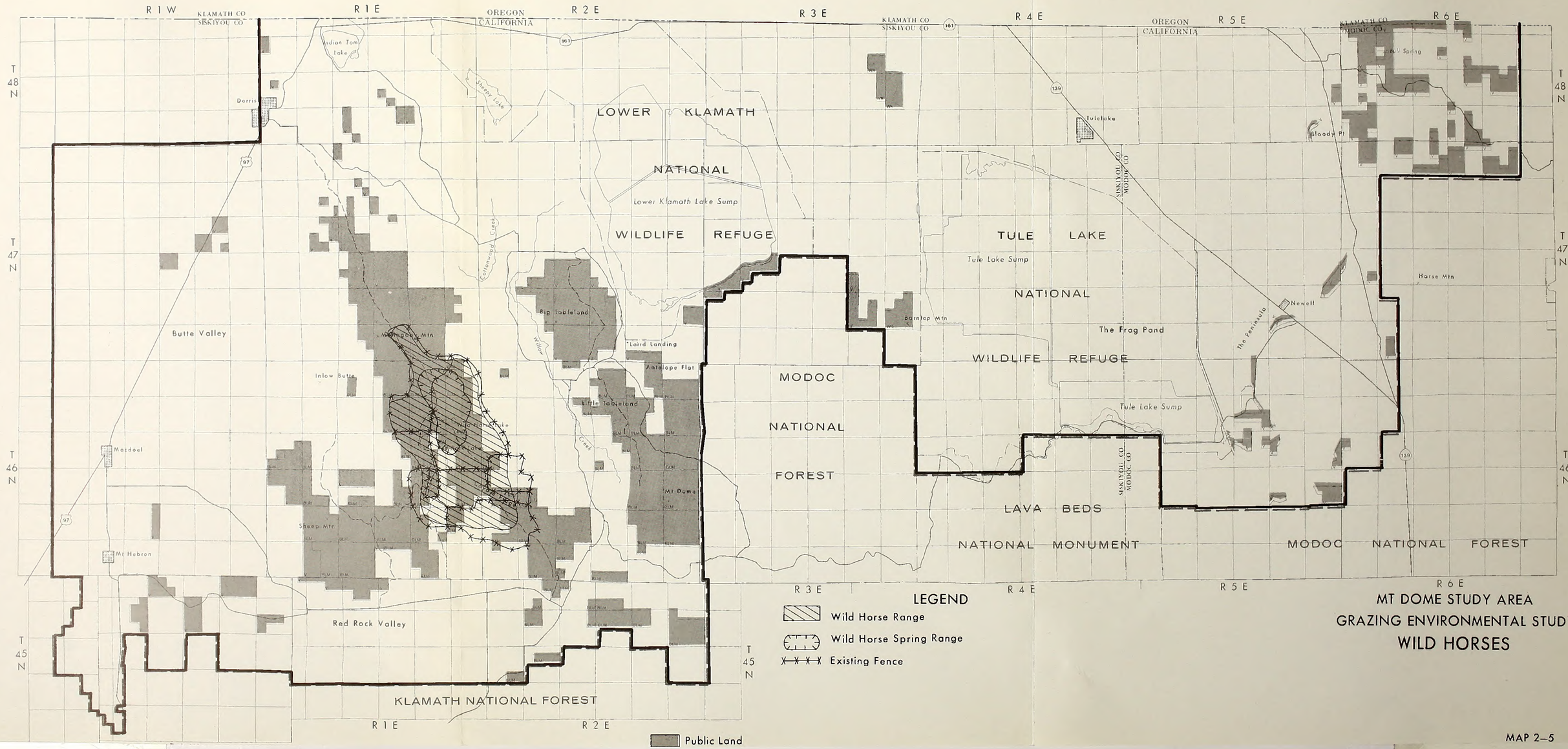
Ecological Condition	Acres	Percent
Good	450	8
Fair	1,909	35
Poor	3,110	57

Herd Characteristics

The Red Rock wild horses are an isolated remnant of a once-large population of horses which roamed the entire Butte and Red Rock Valleys area with domestic additions from local ranches. Horse numbers were initially estimated by casual BLM observations at six in 1971 and at seven in 1973. The present estimate of the total Red Rock herd, also based on casual observations by BLM personnel, is 20 horses. The greatest recorded number in the herd was 30 in the spring of 1977 (18 males, 7 females, 5 undetermined). This count involved aerial reconnaissance and field observations over a five week period from late May until early July of 1977 (Bridwell, 1977). There is no firm evidence to indicate whether the apparent increases before 1977 or the decreases after then are due to natural birth and death differences, inaccurate counts or temporary additions of local domestic horses.

Seven bands of wild horses were identified in 1977 (Bridwell, 1977). All but one band are dominated by a stallion. Bands average four to five horses during the summers.

The Red Rock horses foal in early May. The reproductive rate appears to be one foal per band in alternate years, resulting in an average of one


R1W
R1E
R2E
R3E
R4E
R5E
R6E
T 48 N
T 47 N
T 46 N
T 45 N
KLAMATH CO
SISKIYOU CO
OREGON
CALIFORNIA
MODOC CO
LOWER KLAMATH
NATIONAL
Lower Klamath Lake Sump
WILDLIFE REFUGE
TULE LAKE
Tule Lake Sump
NATIONAL
WILDLIFE REFUGE
MODOC
NATIONAL
FOREST
LAVA BEDS
NATIONAL MONUMENT
MODOC NATIONAL FOREST
KLAMATH NATIONAL FOREST
Butte Valley
Red Rock Valley
Indian Tom Lake
Sheepy Lake
Cottonwood Creek
Willow Creek
Big Tableland
Little Tableland
Antelope Flat
Laird Landing
Inlow Butte
Mt Dome
Sheep Mtn
Mt Hebron
Mt Hebron
Dorris
Tulelake
Newell
Bloody Pt
Horse Mtn
Barnlop Mtn
The Frag Pond
The Peninsula
Tule Lake Sump
Bull Spring
97
139
161
LEGEND
Wild Horse Range
Wild Horse Spring Range
Existing Fence
Public Land
MT DOME STUDY AREA
GRAZING ENVIRONMENTAL STUDY
WILD HORSES
MAP 2–5

foal per 10 adults per year. The observable good health of the herd indicates that food supply for the herd has been generally adequate up to this time.

Map 2-5 shows the wild horse herd management area. Herd distribution and movement patterns are unknown except for the general horse boundary and estimated spring range.

The horse herd consumes up to 240 AUMs annually. Grasses are primarily used by horses during the spring, summer, and fall. During the winter, more shrubs are used (Feist, 1971; Hall, 1972). Although horses are primarily grazers and deer are primarily browsers, low to medium competition between deer and horses occurs in early spring, when both classes of animals favor grasses. Horses compete with cattle since their diets appear to be 60-98 percent similar (Hubbard and Hansen, 1976). The extent of social interaction between wild horses in the Red Rock herd and other animals is unknown. Water is not a major concern except during drought years, when reservoir fencing placed to protect shoreline vegetation severely restricts access. During the drought year of 1977, four dead horses were found. Two were found mired in mud in Wild Horse Lake. In addition to the hazards of the mud, it is surmized that during drought conditions, with short water supply, more mud and inorganic undigestable material are ingested which block a horse's stomach and lower intestines.

The carrying capacity of the horse range was determined by extrapolating data from the vegetative inventory (Table 2-8). Presently there are approximately 101 deer AUMs, 727 livestock AUMs, and 240 horse AUMs being consumed on the wild horse range. Present forage production on the same range is 1,330 so that the total 1,068 AUM consumption by the three major consumers is about 80 percent of average annual forage production. The dietary overlap is approximately 1 percent of the deer forage and 77 percent of the livestock forage (Hansen, Clark, and Lawhorn, 1977). The existing horse herd requires approximately 240 AUMs, of which 185 overlap with cows and one overlaps with deer.

Wildlife

Data Base

The most recent wildlife inventory for the Mount Dome EIS area was initiated in 1977, with intensive inventories beginning in 1978. Wildlife inventories in 1978 covered 28 percent of Bureau-administrated lands in the Mount Dome Planning Unit. Other data used for this EIS came from the BLM planning system and district wildlife inventory files, which include much information from the California Department of Fish and Game (CDFG).

The primary data collected in 1978 determined species occurrence by vegetation association and relative abundance of species of birds and mammals which characterize the area.

TABLE 2-8

WILD HORSE HERD RANGE AREA, FORAGE PRODUCTION, AND POTENTIAL STOCKING LEVEL

Allotment	Total Acres	Acres in Horse Range	Allocatable AUMs on Suitable* Horse Range	Current Deer Consumption (AUMs)	AUMs Available After Deer Use	Horses Supportable by Available Forage (without livestock)
Porterfield	4699	2800	377	51	326	27
Ericson, Dave	2809	230	23	6	17	1
Ericson, Don	1279	1279	128	23	105	9
Taylor	1160	280	26	4	22	2
Orahood	439	140	23	3	20	2
Tablelands, South	1440	740	88	14	74	6
Total	11,526	5,469	665	101	564	47

* Areas eliminated as unsuitable include rock talus and cliffs, which are too steep or devoid of vegetation.

Deer and antelope population estimates for the Mount Dome Planning Unit were obtained from the California Department of Fish and Game (Pyshora, 1979, personal communication). Deer and antelope populations on BLM-administered lands were estimated proportionately by area (Appendix H).

General

Wildlife species in the Mount Dome EIS area are representative of the Columbian Plateau, sagebrush steppe vegetation type and influenced by the Klamath Basin National Wildlife Refuge System. The Tulelake and Lower Klamath Refuges support large breeding populations of waterfowl and have one of the largest concentrations of wintering waterfowl in the United States. This refuge system also supports large and diverse populations of riparian-associated wildlife species. In turn, these wildlife populations include the primary prey species for large populations of raptors, including bald eagles and peregrine falcons, that use BLM-administered land.

Discussions on terrestrial wildlife are directed toward federally listed threatened and endangered species, proposed BLM sensitive species, and deer and antelope. A list of species not discussed in this EIS, their abundance and their season of occurrence, is available at the BLM Redding District Office.

Federally Listed Threatened or Endangered Species

The bald eagle and peregrine falcon are primarily winter residents of the EIS area. The two species feed mainly on prey species that use the Tule Lake and Lower Klamath Refuges. Mount Dome provides a roost area for up to 200 wintering bald eagles. This is the only known roost on BLM-administered land in the EIS area. Both of these species migrate north by April 15 each year. There is no known nesting on public grazing lands within the Mount Dome EIS area.

BLM Proposed Sensitive Species

A 1979 inventory on public lands in the Mount Dome Planning Unit located seven active nest pairs of Swainson's hawk and six active golden eagle nests (Map 2-6). Insufficient data exist to accurately determine population trends, but both species appear to be stable.

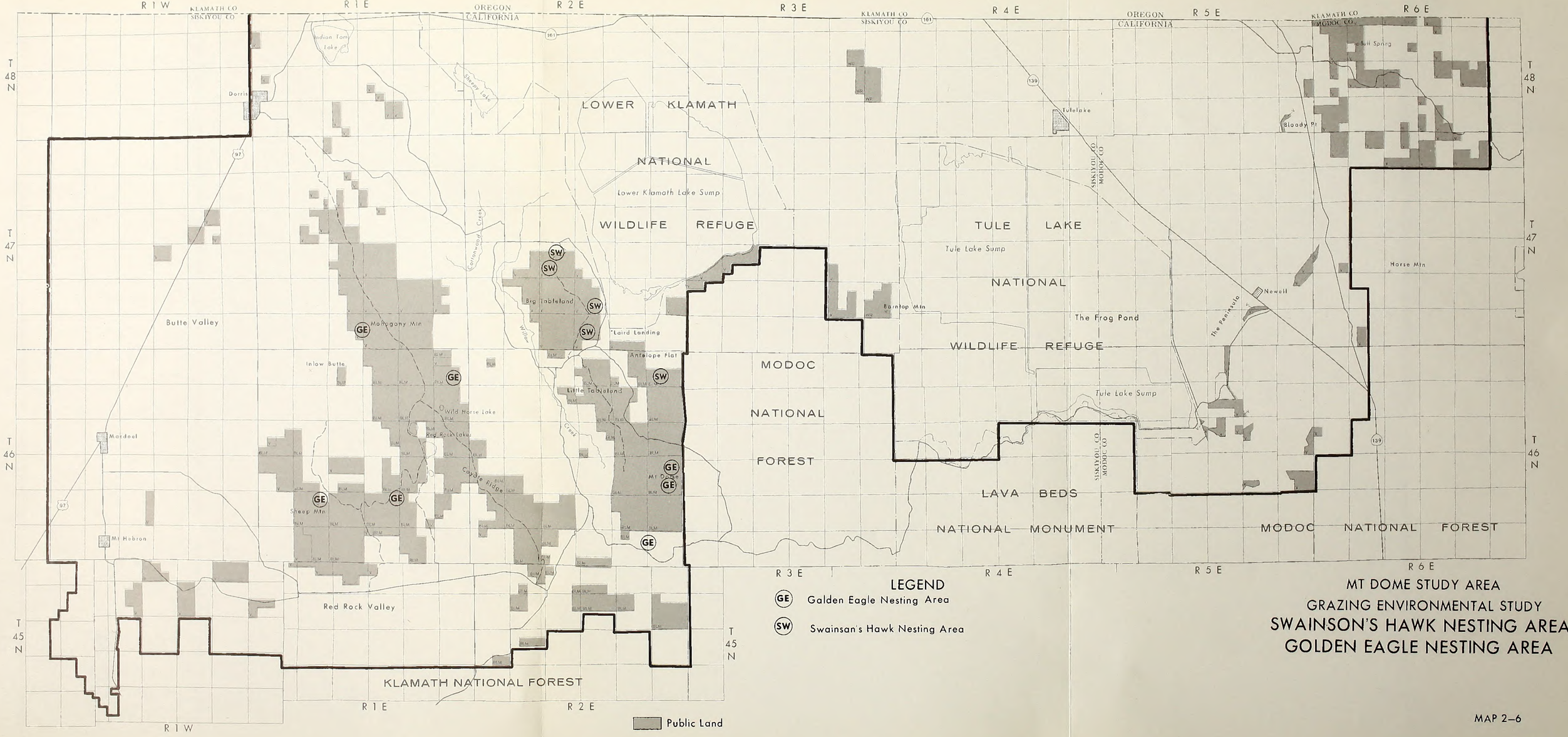
Deer and Antelope

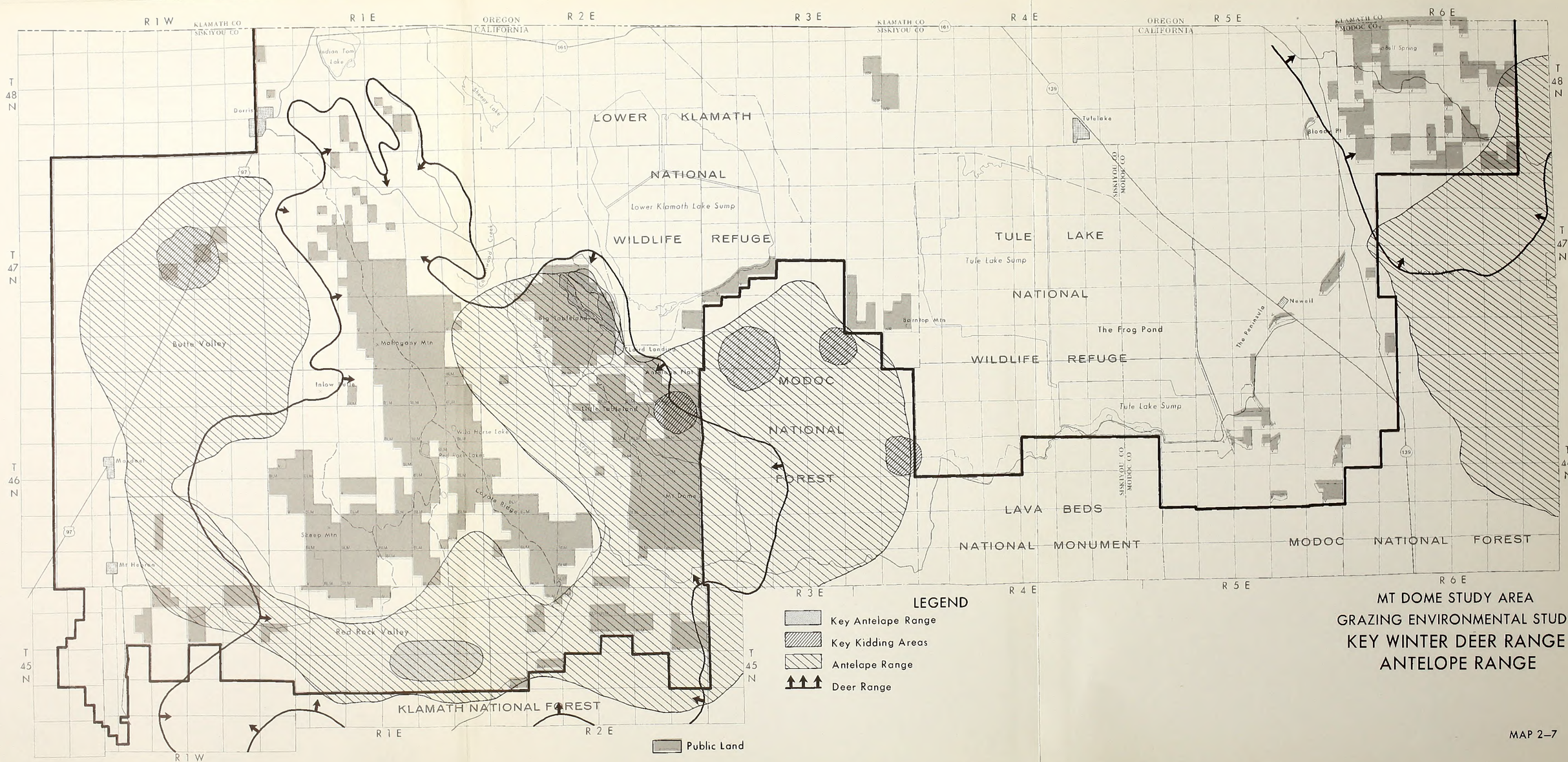
Both mule deer and black-tailed deer occur in the EIS area. Public lands within the Mount Dome Planning Unit provide 13 percent of the crucial winter range for deer in four mixed deer herds (those containing both mule deer, black-tailed deer, and their hybrids). These herds are Pleasant Valley, a sub-unit of the Klamath Interstate herd; Butte Creek and Mount Dome, both sub-units of the Shasta herd; and Bryant Mountain, a sub-unit of the Devils Garden herd. See Table 2-9 for population estimates by allotment and season of use and Map 2-7 for distribution.

TABLE 2-9

DEER AND ANTELOPE POPULATION ESTIMATES AND SEASONS OF USE AND DEER HABITAT CONDITION (BY ALLOTMENT)

	Pop. Est Winter Deer	Season of Use	Avg. Deer Habitat Condition	Pop. Est. Antelope	Season of Use
Ericson, Don	142	11-5/4-15	Poor		
Johnson, Stanley	91		Poor	0	
Johnson, Dalton, Halousek	13		Poor		
Loveness Lumber	113		Fair		
Orahood	49		Poor		
Parsons/Robinson	160		Poor	0	
Criss, Wayne	51		Poor	28	3-15/7-1
Porterfield Ranch I	521		Fair	0	
Truax-Red Rock	102		Poor	28	5-15/7-15
Tablelands South	160		Fair	0	
Beck Ranch, Inc.	202		Poor		
Ericson, David	406		Fair		
Farnam	18	11-15/4-15	Poor	0	
Hadan Livestock	257		Poor		
Johnson Stock Company	420		Poor		
Langer	244		Poor		
Moore	14		Fair		
Parsons	40		Poor		
Parsons/Robinson	80		Poor		
Porterfield Ranch II	102		Poor	56	5-15/7-15
Schader	216		Fair	0	
Sites	86		Poor		
Smith	36		Fair		
Sullivan	60		Poor		
Taylor	106		Poor		
Truax-Sheep Mountain	67		Fair		
Tablelands North	639	11-15/4-15	Poor	70	5-15/7-15
Total	4,395			182	


R1W
R1E
R2E
R3E
R4E
R5E
R6E
OREGON
CALIFORNIA
KLAMATH CO
SISKIYOU CO
MODOC CO
T 48 N
T 47 N
T 46 N
T 45 N
LOWER KLAMATH
NATIONAL
Lower Klamath Lake Sump
WILDLIFE REFUGE
TULE LAKE
Tule Lake Sump
NATIONAL
The Frog Pond
WILDLIFE REFUGE
MODOC
NATIONAL
FOREST
LAVA BEDS
NATIONAL MONUMENT
MODOC NATIONAL FOREST
KLAMATH NATIONAL FOREST
Butte Valley
Red Rock Valley
Dorris
Tulelake
Newell
Mt Hebron
Mardoel
Indian Tom Lake
Sheepy Lake
Cottonwood Creek
Willow Creek
Big Tableland
Little Tableland
Antelope Flat
Laird Landing
Mahogany Mtn
Inlow Butte
Wild Horse Lake
Red Rock Lakes
Coyote Ridge
Sheep Mtn
Mt Dome
Barntop Mtn
The Peninsula
Bloody Pt
Bull Spring
Horse Mtn
SW
GE
LEGEND
Golden Eagle Nesting Area
Swainsan's Hawk Nesting Area
Public Land
MT DOME STUDY AREA
GRAZING ENVIRONMENTAL STUDY
SWAINSON'S HAWK NESTING AREA
GOLDEN EAGLE NESTING AREA
MAP 2–6



MT DOME STUDY AREA
GRAZING ENVIRONMENTAL STUDY
KEY WINTER DEER RANGE
ANTELOPE RANGE

MAP 2–7

Pronghorn antelope are year-round residents of the EIS area but only use public grazing lands between approximately March 1 and July 1. Most of the antelope forage is provided by the private lands that surround the public lands. Population estimates and season of use by allotment are shown in Table 2-9. Distribution, crucial wintering areas, and kidding grounds are shown on Map 2-7. California Department of Fish and Game information indicates that population trends are up.

Deer habitat condition on public grazing land is presently 67 percent "poor" and 33 percent "fair". Table 2-9 shows habitat condition by allotment. Appendix I lists, by allotment, the percentage of big game range used by livestock.

The habitat conditions listed in Table 2-9 are based on frequency of occurrence of two indicator species, bitterbrush and big sagebrush. Recent studies indicate that the ranges listed below are representative of habitat condition for big game in a comparable situation (Spalenger 1980):

	Poor	Fair	Good
Bitterbrush	0-1.5%	1.6-2.5%	2.6-6.0%
Big Sagebrush	0-5%	5.1-10.0%	10.1-15%

For key woody species occurrence by allotment, see Appendix J.

RECREATION

The Mount Dome Unit Resource Analysis (URA) has identified general leisure activities such as camping, picnicking, sightseeing and off-road-vehicle play occurring on public lands. There is, however, no data concerning either specific recreation activities or numbers of recreation days.

There are no developed campgrounds or other recreation facilities on public lands in the Planning Unit, however, several undeveloped sites are used by hunters and other visitors. Deer is the most important game species in the area. Approximately five percent of the total annual deer harvest for the area is estimated to be taken within the boundaries of the public grazing lands (Payton, 1979).

Four-wheel-drive vehicles are used on public lands throughout the area in support of recreational activities as well as in support of commercial operations, such as livestock grazing. Most ORV use occurs on dirt roads and ways, rather than cross-country due to the amount of surface rock and brushy vegetation on much of the area.

WILDERNESS RESOURCES

The public lands included in the Mount Dome Planning Unit have been subjected to wilderness review as directed by the Federal Land Policy and Management Act of 1976 (FLPMA). The review determined that the public lands in the Mount Dome Planning Unit do not possess characteristics necessary for further consideration as wilderness. This inventory decision for the public lands in the Bryant Mountain area along the western leg of the Alaska Natural Gas Transmission System in California was published in the Federal Register on February 15, 1979, and became final on March 19, 1979. The wilderness inventory decision on the remainder of the lands within the Planning Unit was published in the Federal Register on July 16, 1979, and became final on August 15, 1979. The documentation of the inventory process and rationale leading to the final decisions are on file at the BLM Redding District Office.

CULTURAL RESOURCES

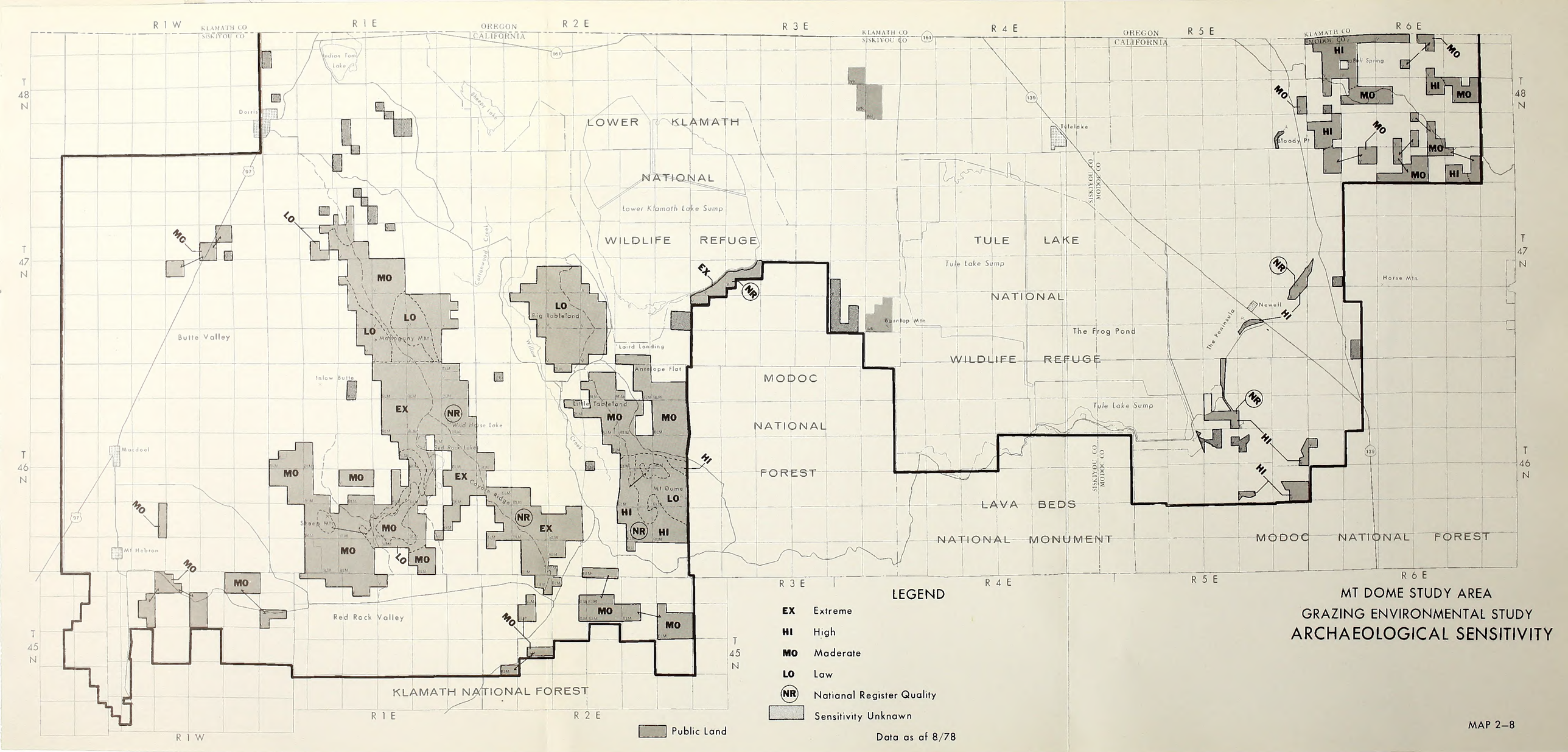
Data Base

Understanding of the archaeology of the Mount Dome-Lower Klamath Basin Region derives from Cressman's (1940, 1942) researches in south-Central Oregon and the northern Great Basin; unpublished manuscripts by Squier and Grosscup (1952), covering an archaeological survey of Lava Beds National Monument; Swartz' (1961) unpublished survey of the south shore of Tule Lake and (1964) excavation of CA-SIS-101; Johnson's (1969) and Grayson's (1972) unpublished writings which deal with the extraordinary excavations on Nightfire Island; and Hardesty and Fox's (1974) survey of Lava Beds National Monument and Medicine Lake Highlands.

In 1976, the Bureau undertook an archaeological overview (Friedman, 1976) and an archaeological reconnaissance (Friedman, 1977) of the Mount Dome Planning Unit. Further studies by Quillen (1978a, 1978b) added to the archaeologic and historic data bases and enabled stratification of the planning unit by archaeological sensitivity (Map 2-8).

Archaeological Resources

The Mount Dome Study Area is the westernmost extension of the Great Basin Cultural Area (Kroeber, 1953, Map 6). The region was occupied by hunting and gathering bands whose subsistence focused on seasonal exploitation of a great diversity of plant and animal foods. Populations shifted throughout the year in response to the availability of food, with the result that several micro-environments were visited in a seasonal round. Land use and settlement patterns were geographically extensive. This pattern of seasonal transhumance may have begun in the late Wisconsin Glacial Period, some 25,000 years ago, in the Great Basin Lakes Country (Davis, 1978, p. 10-13). Lower Klamath Lake in the Mount Dome Planning Unit is the western extension of these (now mostly extinct) Pleistocene lakes. At the time of historic contact, the study area was occupied by two distinct Modoc bands, a western group centered around Hot Creek and



LEGEND

- EX Extreme
- HI High
- MO Moderate
- LO Law
- NR Natianal Register Quality
- Sensitivity Unknown
- Public Land

Data as of 8/78

MT DOME STUDY AREA
GRAZING ENVIRONMENTAL STUDY
ARCHAEOLOGICAL SENSITIVITY

MAP 2–8

an eastern group along Lost River (Quillen, 1978a). Three factors affected the subsistence and/or settlement patterns (and thereby the occurrence of sites) of the native inhabitants: (1) changing climate (anathermal, alithermal, and medithermal) (Antevs, 1948, p. 169-191); (2) volcanic activity as recently as 500 years ago (Chesterman, 1971, p. 143); and (3) the historic Modoc War of 1872-73 (Thompson, 1971). Two other natural phenomena influenced archaeological inventory design and site survival. These are the invasion of juniper forests into zones previously dominated by sagebrush-bunchgrass communities, brought about when the aboriginal practice of burning stopped with the removal of the Indians (Shinn, 1979, p. 1135) and the drainage of Lower Klamath and Tule Lakes (Friedman, 1976, p. 5; Quillen, 1978a, p. 6).

Settlement patterns were not clearly defined by the surveys, possibly due to the fragmented nature of the federally managed lands. There is a very strong correlation between large, long-term occupation sites and the occurrence of reliable water sources. In the Mount Dome area a small percentage of hunting and/or food processing camps are found where the water source is unknown or extinct. The extent of the effect of juniper forestation on spring drying and water tables has not been studied.

The survey of 7.4 percent or 3,111 acres (1,308 acres or 2.75 percent by Friedman, 1,803 acres or 4.65 percent by Quillen) resulted in the recordation of 73 sites. From this, the probability of one site per every 42.6 acres is projected, or approximately 1,000 anticipated sites in the planning unit.

Friedman described all sites recorded by her survey team as "lithic scatters" (1976, p. 9). Quillen, however, refined his descriptions into hunter's encampments/workshops, seasonal villages, and historic sites. No piled stone constructions, caves, rock-shelters, quarries, or trails were reported in the surveys, but such phenomena are known from project-related or other investigations (Mt. Dome, URA 3, 1979, tabulated cultural resource site data).

Historical Resources

The original stock ranches, established in the third quarter of the 19th century, caused considerable havoc to the aboriginal environment. Ancient hunting grounds were fenced (Thompson, 1971, p. ix), perennial vegetation was grazed nearly to extinction (USDI, BLM 1978a, p. 2, 134-136), and cessation of the aboriginal practice of brush burning contributed to a juniper encroachment that has become an environmental problem (Shinn, 1979) and may have caused the demise of some springs (Quillen, 1978a, p. 8).

The conflict between the U.S. Army and Indians, known as the Modoc War of 1872-73, occurred mostly within the Mount Dome Planning Unit (Quillen, 1978a, p. 9; Thompson, 1971, Map 11). The Modocs successfully held off the Army for six months by holing up in The Lava Beds, which are now

administered as a national monument by the National Park Service (USDI, NPS, 1977, p. 1-26). Land status and events which may yield historical evidence or have commemorative and/or interpretive values are shown on Map 2-9.

Following the surrender of the Modocs on June 1, 1873, the aboriginal population was permanently removed from the Mount Dome Planning Unit. Homesteaders moved in and attempted to eke out a living as farmers/ranchers, though the best agricultural and pasture land had already been claimed by the large stock raisers. Lairds Landing, near a major Modoc winter village, served as a busy trade port. Emmigrant trails, which later became wagon roads, traversing portions of public lands (for example, Tickner Road - - Thompson, 1971), were the thoroughfares by which goods were brought to the Landing. These goods were then placed on paddle-wheel boats, and transported to Linkville, now Klamath Falls.

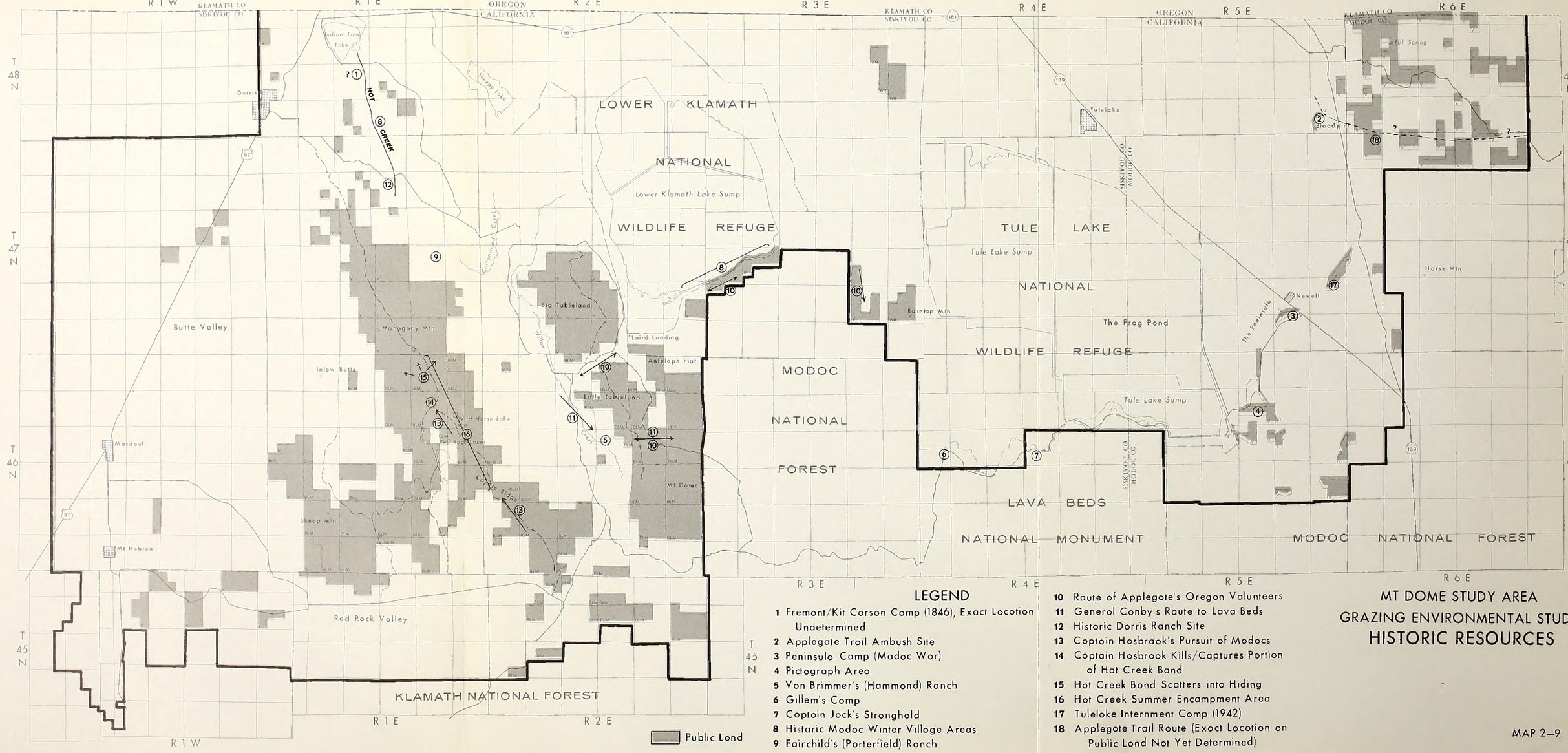
Evidence of a more populous settlement in Willow, Cottonwood, and Hot Creek Valleys is indicated by the numerous decaying remains of homes, cabins, and barns. In 1918, an influenza epidemic swept through the region, nearly depopulating it (Quillen, 1978a, p. 15). In some instances, abandoned early homesteads reverted to public land status.

Cultural Resources of National Register Quality

There are six known sites and/or archaeological districts within the study area which qualify for nomination to the National Register of Historic Places (Map 2-9). Based upon the 1977-78 survey data, and applying the criteria established in 36 CFR 800 (Advisory Council on Historic Preservation), there are an estimated 100 sites and/or districts on public lands in the Mount Dome Planning Unit which would qualify for the National Register (Mt. Dome URA 3). These sites in general exhibit superior integrity of their constituents, relative uniqueness (that is, they are superior examples of their type), the potential for yielding significant information for the reconstruction of local patterns of prehistory (USDI, BLM, 1978a, p. 2-137), and/or are associated with events that have made a significant contribution to the broad patterns of our history (that is, the Modoc War). Adequate inventory (36 CFR 800.4) is still in its infancy for the Mount Dome Planning Unit.

Resources Having Native American Heritage Values

The contemporary Modoc community is based in Missouri and Kansas, except for a handful of surviving descendants in southern Oregon and northeastern California. Traditional religious values relative to sites on or use of public lands which were formerly their homelands are unknown. Consultation with members of the Modoc Tribe, including direct decendants of principals from the Modoc War, has shown a high interest in preservation of the heritage values, including both prehistoric and ethno-historic elements (Quillen, 1978a).



LEGEND

1 Fremont/Kit Corson Comp (1846), Exact Locotion Undetermined
2 Applegate Troil Ambush Site
3 Peninsulo Camp (Madoc Wor)
4 Pictograph Areo
5 Von Brimmer's (Hammond) Ranch
6 Gillem's Comp
7 Coptoin Jock's Stronghold
8 Histaric Modoc Winter Villoge Areas
9 Fairchild's (Porterfield) Ronch
10 Raute of Applegote's Oregon Valunteers
11 Generol Conby's Raute to Lava Beds
12 Historic Dorris Ranch Site
13 Coptoin Hosbraok's Pursuit of Modocs
14 Coptain Hosbrook Kills/Captures Portion of Hat Creek Band
15 Hot Creek Bond Scatters into Hiding
16 Hot Creek Summer Encampment Area
17 Tuleloke Internment Comp (1942)
18 Applegote Trail Route (Exoct Locotion on Public Lond Not Yet Determined)

MT DOME STUDY AREA
GRAZING ENVIRONMENTAL STUDY
HISTORIC RESOURCES

MAP 2—9

Factors Currently Affecting Cultural Resources

Three factors are at work destroying the content and integrity of archaeological and historic sites in the Mount Dome Planning Unit. Together, they account for nearly all of the present condition of the sites.

Natural Degradation--This process includes the decay of organic materials, lumber in historic buildings, vegetal encroachment including root damage, rust of metallic artifacts, natural erosion, and site compression.

Grazing and Reduction of Vegetation--There has been no long-term program of monitoring to quantify the degree to which grazing accelerates the impacts of natural erosion. At Site CA-SIS-440 on the western slope of Mount Dome, sandy soil over fractured lava is held primarily by rabbitbrush and juniper. There, vertical displacement of artifacts from 40 to 80 feet was observed on a 15-20 percent slope. The site was systematically collected in 1977 to allow for a wildlife guzzler. Subsurface testing disclosed no stratification or subsurface deposits. Yet, a visit to the site in June 1978, disclosed that slopewash and other erosional factors had exposed a significant quantity of cultural debris.

Under geomorphological circumstances similiar to those in Mount Dome, at Site BLM-030-06-21-77-2, in the Cinder Cone area of eastern Shasta County, concentrating livestock had reduced a two-component (prehistoric/historic) site to a single surface level of miniature fragments (avg. less than ½ inch-square pieces of obsidian and rhyolite artifacts and 19th century European crockery). The cattle had gathered where a gate, salt-lick, and feed-drop coincided with part of a large cultural site. At the same site, construction of a small reservoir/pond and brush-clearing followed by drill-seeding caused a significant amount of vertical and horizontal displacement.

Vandalism--The looting of archeological sites, both through surface collecting of artifacts and excavation (especially at larger villages and cave sites) is an illicit recreational and commercial activity which has been energetically pursued for several decades in the Mount Dome Planning Unit. One important village site, CA-SIS-636 on the south shore of Lower Klamath Lake has been over 75 percent destroyed by artifact seekers. The intensity of surface collecting cannot be adequately quantified, but local collections, including a commercial enterprise in Klamath Falls, are extensive. The testimony of collectors and rockhounds indicates that few easily accessible and recognizable sites have escaped attention (see also USDI, BLM, 1978a, p. 2-134).

VISUAL RESOURCES

Data Base

Scenic quality, distance zones, visitor use rates, and sensitivity toward change in the EIS area landscape were analyzed in 1978-79 by BLM.

Characteristic Landscape

The area is typified by open sagebrush-grassland flats uplifting to juniper grasslands and pine-fir forests. Since the area is of volcanic origin, lava flows, rims and cliffs are characteristic of the landscape.

The most visually prominent features within the planning unit include Sheep Mountain, Copic Bay Peninsula, Mount Dome, and Mahogany Mountain. Other outstanding areas include Tule Lake and Lower Klamath Wildlife Refuges and Lava Beds National Monument.

Small towns, agricultural lands, ranches, secondary roads, minor utility lines, and range projects are integral to this rural landscape and do not detract severely from visual quality.

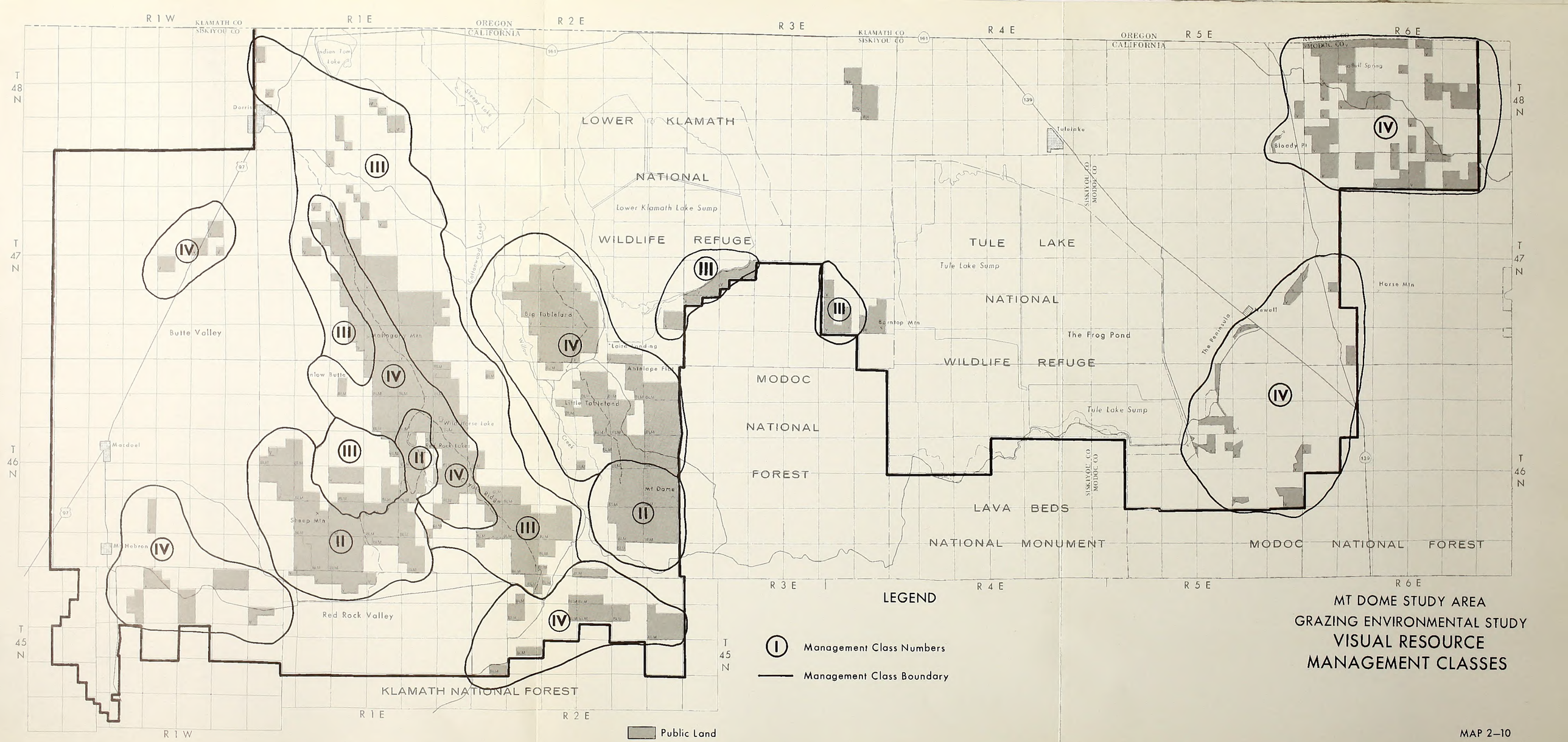
Visual Resource Management Classes

Scenic quality, distance zones, and the public's attitude toward change in the landscape were analyzed in order to establish Visual Resources Management (VRM) classes (BLM Manual 8400) (Appendix K). Each class has management objectives which are the basis for evaluating the acceptability of proposed activities.

Visual resource management objectives for Classes II-IV, found in the Mount Dome Planning Unit, are as follows:

Class II	Changes in any of the basic elements (form, line, color, texture) caused by a management activity should not be evident in the characteristic landscape. A change may be seen but should not attract attention.
Class III	Contrasts to the four basic elements caused by a management activity may be evident and begin to attract attention in the characteristic landscape. The changes, however, should remain subordinate to the existing characteristic landscape.
Class IV	Contrasts may attract attention and be a dominant feature of the landscape in terms of scale, however, the change should repeat the basic elements inherent in the characteristic landscape.

Approximately 9,640 acres of public lands within the Mount Dome Planning Unit fall into Class II, while 11,040 acres are in Class III and 21,320 in Class IV (Map 2-10). No areas of Class I or V have been identified in or around the Planning Unit.



MT DOME STUDY AREA
GRAZING ENVIRONMENTAL STUDY

VISUAL RESOURCE MANAGEMENT CLASSES

MAP 2–10

SOCIAL AND ECONOMIC CONDITIONS

Social and economic data were derived primarily from the Mount Dome Planning Area Analysis (BLM, 1979) and the Redding District livestock operator files.

The Mount Dome Planning Unit lies primarily within Siskiyou County, California, though it does include a small portion of Modoc County, California. The people living in the Planning Unit are socially and economically linked to Klamath Falls, Oregon, the nearest trade center. Klamath Falls, with an estimated population of 38,000 in the city and environs, is approximately 20 miles to the north.

Population within the Planning Unit is estimated to be 3,000 people. Siskiyou County has a population of 39,700 and Modoc County a population of 9,000. There are five communities within the Mount Dome Planning Unit (Calif. Dept. Transportation, 1976):

	Population
Dorris	860
Macdoel	600
Mount Hebron	150
Tulelake	900
Newell	200

The economy of the Planning Unit is based primarily on agriculture. Farm production in the Klamath Basin, which includes portions of both California and Oregon, is concentrated in livestock, potatoes, onions, hay, and grain. Precise sub-county data for the Planning Unit are unavailable, however, livestock contributes about 43 percent of the gross farm income in the Klamath Basin, which may be considered typical for the Mount Dome area.

Total Federal land constitutes about 32 percent of the Planning Unit. The BLM manages about 9 percent of the land, the U.S. Forest Service 4 percent, Water and Power Resource Services 18 percent (Klamath Project withdrawal), and U.S. Fish and Wildlife Service the remaining 1 percent.

There are 20 operators using the 27 existing grazing allotments. These operators own about 9,500 cattle and 2,700 sheep, about 25 percent of the beef cattle and about 35 percent of the sheep in Siskiyou County. The Mount Dome allotments provide about 5 percent of the cattle feed and 9 percent of the sheep feed required for these operators.

To simplify the following discussion, 19 operators have been separated into four categories: sheep operators, small operators (less than 250 cattle), medium operators (250 to 500 cattle), and larger operators (500+ cattle). A representative ranch budget for a 150 low ranch has been included as Appendix L.

There are two sheep operators among the Mount Dome allotment operators. They derive 9 percent of their forage from their BLM allotments. Both operators also have permits for grazing on National Forest lands. Both are full-time sheep operators.

The 10 small cattle operators, with herds of less than 250 animals, are generally part-time cattle operators. Most have other agricultural enterprises such as potato or grain crops. These operators fullfill 12 percent of their livestock forage needs from their BLM allotments. At least one of these operators is known to be using his allotment much less than his permitted amount.

The three medium operators (250-500 head) may have large enough herds to be full-time livestock ranchers. These operators obtain about 8 percent of their forage requirements from their BLM allotments. All have National Forest grazing permits or own other ranches outside of the Mount Dome Planning Unit.

Four large operators in the Mount Dome Planning Unit have herds which clearly put them into the category of economically viable, full-time ranches. Three percent of these operators' forage requirements are met by their Mount Dome allotments. All of these operators also have grazing permits on the Klamath or Modoc National Forests and some have BLM permits in the Lakeview, Oregon, District. Though these operators used 45 percent of the allocated forage on public grazing lands in the Mount Dome Planning Unit, they are the least dependent upon these allotments for total feed supply.

Chapter 3

ENVIRONMENTAL CONSEQUENCES OF ALTERNATIVES

This chapter analyzes the consequences of implementing each of the five proposed alternatives. Both short and long-term consequences are analyzed when appropriate. "Short term" is the four years during which the grazing treatments and stocking rates would be implemented and physical and vegetation range projects completed. "Long term" would be 20 years after implementation.

All impacts are considered as changes from the present (1980) condition. Unless otherwise noted, all impacts described are those remaining after all standard operating procedures, planned mitigation, and assumptions described below have been implemented.

Unless otherwise noted, the alternatives would not result in significant impacts on climate, topography, air or water quality, geology, mineral resources, or paleontological resources.

Environmental consequences of the moderate use (preferred) alternative are described fully. To avoid repetition, consequences of other alternatives are described only when they differ from the moderate use alternative.

ASSUMPTIONS AND ANALYSIS GUIDELINES

1. The selected alternative would be implemented over the four-year period following completion of the final environmental statement.

2. When allotment management plans are prepared, an environmental analysis would be carried out to assess the impacts of the grazing treatments and site-specific impacts of range projects and vegetation manipulations.

3. The Bureau of Land Management (BLM) would fund the projects required to implement the selected alternative and would do so within the stated timeframe.

4. A wild horse management plan would be prepared for the management of the wild horses on public grazing lands. An environmental assessment would be prepared on this management plan.

5. The necessary work force would be available to implement the action and carry out the monitoring program.

6. Range projects described in Chapter 1 would be maintained in a serviceable condition.

MODERATE USE ALTERNATIVE (PREFERRED)

Four types of grazing treatments are proposed under the preferred alternative. Rest seasonal would be implemented on six allotments containing 4,461 acres, deferred seasonal would be implemented on four allotments containing 7,280 acres, and continuous seasonal would be implemented on 15 allotments containing 18,110 acres. The present rest-rotation system would be continued on 5,774 acres and deferred seasonal on 1,440 acres. The grazing treatments are described in Chapter 1. In addition to these treatments, total forage allocation for livestock would be reduced by 37 percent.

Impacts on Air Quality

Dust and smoke resulting from the vegetation manipulation would cause a temporary increase in total suspended particulates (TSP). Impacts on the air basin and surrounding populations centers would range from nonexistent to minimal. The effects would be localized and have minimal impact on visability.

Impacts on Vegetation

Most allotments are composed of more than one ecological type. Because each type is not individually fenced, livestock grazing would not be of equal intensity on each type. Lack of information on response of ecological types to different treatments and stocking levels and lack of livestock control by site type eliminates accurate predictions of vegetation response by type. Predicted responses to the alternative actions will therefore be based on an average of all types. Exceptional allotments are noted individually.

The overall ecological range condition and trend would improve through the increased vigor of plants and increased natural seedings during the treatment cycles. Poollen and Lacey (1979) tabulated 18 different studies on western ranges and found that average herbage production was 13 percent higher when livestock use was controlled by a specialized grazing treatment, rather than being continuous. Production increases were larger (27%) when continuous seasonal livestock use was reduced from heavy to moderate. The combination of livestock adjustments and the effect of the proposed grazing treatments under the moderate use alternative would result in improved vegetation composition. Rest treatments, which provide periodic relief from grazing, would allow the phenological and biological development stages of important species to be completed. When coupled with a reduced stocking rate, the rest seasonal treatment, on the average, is expected to change the condition class to the next higher class in 20 years: 1725 poor acres to fair, and 2376 fair acres to good. Under the deferred seasonal treatment, 1607 acres would improve from poor to fair and 6608 acres from fair to good in 20 years. Under both treatment types, acreage presently in good ecological condition would be maintained in that state except where present trend is upward. In that situation good acres would improve to excellent (Tables 3-1 and 3-2).

TABLE 3-1

PREDICTED LONG-TERM CHANGES IN ALLOCATABLE FORAGE DUE TO COMPONENTS OF MODERATE USE ALTERNATIVE

	1979 Level	Change Due to Stocking Levels		Change Due to Vegetation Manipulation		Net Change (B+C+D+E)	Year 2000 Level (A+F)**
	A	B	C	D	E	F	G
ECOLOGICAL CONDITION (acres)		(-)	(+)	(-)	(+)		
Poor	10,252	7,283	0	2,529	0	- 9,812	440
Fair	17,374	17,223	7,283	151	1,549	- 8,542	8,832
Good	1,760	221	17,223	0	151	+17,153	18,913
Excellent	0	0	221	0	0	+ 221	221
TREND (acres)							
Declining	12,534	9,854	0	2,680	0	-12,534	0
Stable	10,181	9,741	0	0	0	- 9,741	440
Improving	6,671	0	19,595	0	1,700	+21,295	27,966
SEEDINGS (acres)*	1,022	-	-	0	980	+ 980	2,002
PRODUCTION (AUMs)							
Allocatable forage	4,799	0	2,224	0	271	+2,495	7,294

*Not classified by condition or trend.
**Future conditon and trend totals are less than present because 980 acres would be converted to seedings.

TABLE 3-2

PRESENT ECOLOGICAL VEGETATION CONDITION
AFTER 20 YEARS UNDER THE PREFERRED ALTERNATIVE (IN ACRES)

ALLOTMENT	EXCELLENT FUTURE	GOOD FUTURE	GOOD PRESENT	FAIR FUTURE	FAIR PRESENT	POOR FUTURE	POOR PRESENT
Rest Seasonal							
Ericson, Don	161	385	161	226	385	-	606
Johnson, Stanley		504	-	30	504	-	30
Johnson, Dal./Hal.		15	-	27	15	-	27
Loveness Lumber		532	-	138	532	-	138
Orahood		434	-	5	434	-	5
Parsons/Rob. I		440	90	679	350		919
Sub Total	161	2310	251	1105	2220	-	1725
Deferred Seasonal							
Criss		-	-	452	-	-	452
Porterfield R. I		3639	74	249	3565	-	249
Truax-Red Rock		-	-	480	-	-	800
Tablelands - S.		1260	-	166	1260	-	166
Beck Ranch Inc.		1783	-	30	1783	-	30
Sub Total		6682	74	1377	6608	-	1697
Continuous Seasonal							
Ericson, Dave		886	251	276	635	-	276
Farnam		-	-	160	-	-	160
Hadan Stock		480	-	1036	480	-	1036
Johnson Stock Co.		1887	103	602	1784	-	642
Langer		1209	571	589	638	-	589
Moore						120	120
Parsons		545	189	308	356	-	308
Parsons/Rob. II		510	-	-	510	-	-
Porterfield R. II			-	790		-	790
Schader		1208	-	312	1208	-	312
Sites		760	-	-	760	-	-
Smith						320	320
Sullivan		152	-	198	152	-	198
Taylor		139	15	437	124		437
Truax-Sheep Mt.		541	246	46	295	-	46
Sub Total		8317	1375	4754	6942	440	4398
Rest Rotation							
Tablelands - N.	60	1604	60	1596	1604		1596
Sub Total	60	1604	60	1596	1604		1596
Totals	221	18,913	1760	8832	17,374	440	10,252

Future condition totals are less than present conditon totals because of 960 acres of proposed seedings that would be considered in a different category.

*There is no acreage presently in excellent condition.

Continuous seasonal grazing treatments are designed to minimize plant damage by balancing the number of animals with vegetation resources and the correct season of use. Range under continuous seasonal grazing would generally improve but not in the same magnitude as range under other treatments. In the long term there would be an increase in plant vigor, vegetation composition, vegetation production and range condition by reducing the stocking level 40 percent on continuous seasonal allotments under the moderate use alternative. Professional judgment and analysis of Soil Conservation Service ecological site data (Appendix C) indicate that, as plant vigor improves and perennial plants become larger and healthier, average shrub and grass density would increase from 30 percent toward the 40 percent desired level. The composition of key species would change from 15 to 23 percent (Table 3-3). The average vegetation condition change over the long term under continuous seasonal grazing would include 3,958 acres in poor condition to fair condition 6,952 acres in fair to good, and 221 acres in good to excellent.

In the long term, the allocatable forage (50% of the total current year's consumable growth) under the moderate use proposal is expected to increase 52 percent from 4,799 to 7,294 AUMs. Vegetation production would increase on 25 of 27 grazing leases. The two allotments (Smith and Moore, 440 acres) where native plant production would not show an increase are dominated by introduced cheatgrass and are not favorable for vegetation manipulation due to the topography. In addition, the native perennial species are not adequate to re-establish themselves under management treatments.

Fence construction would allow grazing treatments to be implemented, provide a more uniform use of forage, protect lakeshore habitat and protect vegetation manipulation areas which require rest before initial grazing. Fence construction and pipeline installation would cause a short-term loss of vegetation on 36 acres (6 AUMs), mainly through mechanical injury during implementation. Vegetation disturbance would recover through natural plant succession in the long term. Vegetation (about 2 allocatable AUMs) would be permanently lost on 10 acres due to the construction of 10 reservoirs.

There are portions of public grazing lands in the EIS area which have high production potential due to soil and natural moisture availability but which are presently producing little forage due to the dense overstory of juniper or gray rabbitbrush. Vegetation manipulations on these areas include prescribed brush burning, juniper bulldozing, hand felling juniper, removing dead impeding mahogany, seed drilling or a combination of physical treatments. Table 3-4 identifies acreage by vegetation type and method of physical manipulation for each type. In the long term, changes in vegetation would add 271 allocatable AUMs. Prescribed burning and subsequent wheatgrass drilling would be implemented on 390 acres of native gray rabbitbrush, annual grass and young juniper. The main target species in the prescribed burning areas would be young invading juniper. The vegetation would be changed from dense brush to a grassland-rabbitbrush type and allocatable production would be increased by 45 AUMs.

TABLE 3-3

PERCENT INCREASE OF KEY SPECIES DUE TO MODERATE USE ALTERNATIVE

Range Site	Key Species	Predicted Increase* in Percent Composition over Long Term (20 Years)
Very Shallow Stony Loam	Bluebunch wheatgrass	10
	Sandberg's bluegrass	25
Shallow Stony Loam	Bluebunch wheatgrass	4
	Sandberg's bluegrass	1
	Idaho fescue	1
Stony Loam	Bluebunch wheatgrass	3
	Sandberg's bluegrass	1
	Idaho fescue	1
Loamy	Bluebunch wheatgrass	20
	Sandberg's bluegrass	3
	Idaho fescue	1
Loamy Hardpan	Bluebunch wheatgrass	3
	Idaho fescue	0
Shallow Loamy	Bluebunch wheatgrass	25
	Sandberg's bluegrass	1
	Idaho fescue	0
Sandy	Indian ricegrass	25
	Needlegrass	19
Shallow Sandy	Indian ricegrass	25
	Needlegrass	25
Clay Basins	Sedges	10
	Bushes	10
	Silver Sage	0

*Based on current composition and SCS range site criteria (Appendix C).

TABLE 3-4

AREAS AFFECTED BY PROPOSED DEVELOPMENTS AND VEGETATION MANIPULATION (IN ACRES BY ALTERNATIVE)

PROJECT	PRIMITIVE USE			LIMITED USE			MODERATE USE			EXCLUSIVE USE			NO ACTION		
	UNITS	ACRES DISTURBED SHORT-T	LONG-T	UNITS	ACRES DISTURBED SHORT-T	LONG-T	UNITS	ACRES DISTURBED SHORT-T	LONG-T	UNITS	ACRES DISTURBED SHORT-T	LONG-T	UNITS	ACRES DISTURBED SHORT-T	LONG-T
Fence-Boundary	104 mi.	104	0	1.25 mi.	1.25	0	32.5 mi.	32.5	0	32.5 mi.	32.5	0	4.5 mi.	4.5	0
Fence-Riparian							2.0 mi.	2.0	0	2.0 mi.	2.0	0	-		
Reservoirs	-			10 ea.	10	10	10 ea.	10	10	10 ea.	10	10	-		
Pipeline	-			1.5 mi.	1.5	0	1.5 mi.	1.5	0	1.5 mi.	1.5	0	-		
Water Storage Tank (15,000 gal).	-			1 ea	insignificant		1 ea.	insignificant		1 ea.	insignificant		-		
Prescribed Burning and Seedings	-			390 ac.*	390	0	390 ac.	390	0	390 ac.	390	0	-		
Juniper Bulldozing and Seedings	-					0	590 ac.	590	0	590 ac.	590	0	-		
Juniper Handfelling	-			1700 ac.	1700	0	1700 ac.	1700	0	1700 ac.	1700	0	-		
Dead Mahogany Bucking	-			600 ac.	0	0	600 ac.	0	0	600 ac.	0	0	-		
		104	0		2102.75	10		2726.0	10		2726.0	10		4.5	0

* No seedings under this alternative.

Crested wheatgrass would be drilled on 590 bulldozed acres where the juniper canopy cover is 80-90 percent and native perennial plants are almost non-existent. Based on previous bulldozing and seeding in the EIS area, the seeding would be expected to increase allocatable forage production by 69 AUMs.

Juniper would be removed by chainsaw cutting of 1,700 acres to release the perennial understory plants. Winegar and Elmore (1977) have shown that AUM increases due to juniper removal are quite variable. One study rating vegetation benefits from hand felling juniper in areas similar to the EIS area has given a total increase in native groundcover from 35 percent to 68 percent (Elmore, 1977). Another study at Dairy Hill, Klamath County, Oregon, approximately 25 miles north of the EIS area, showed similar results (Elmore, 1977). Because of this similarity, a 50 percent groundcover increase is projected. Assuming that this increase is totally palatable and available, an allocatable 137-AUM increase was calculated.

Fallen and standing dead mahogany, which impedes livestock movement on 600 acres on the north slope of Sheep Mountain, would be sawed and stacked in piles. Approximately 20 additional AUMs of Idaho fescue would become available for allocation through this action.

Of the total 111 acres of wetland and lake shoreline vegetation, 57 acres would continue to be protected through fencing. The remaining shoreline vegetation surrounding three natural lake basins which cover 47 surface acres and a seven-acre shallow freshwater marsh would also be protected by fencing. Fencing would remove nearly all livestock use and would allow the aquatic vegetation, which is presently in poor to good condition, to reach and maintain its natural ecological condition within 10 years.

Impacts on threatened or endangered (T&E) plant species are not precisely known due to lack of field data, but the potential for impacts appears to be minimal. In accordance with BLM policy, a T&E species inventory and evaluation would be required for all project sites or actions prior to implementation.

Impacts on Soils

Soil suitability for the various range projects and vegetation manipulation on 2,768 acres has been determined by referring to the soil series and mapping unit description. Because of the intermingled soil pattern, small areas of soils, unsuitable in some particular practical way, may be included in larger suitable areas. Total erosion and sediment production associated with the proposed activities would increase slightly in the short-term. Over the long-term, erosion and sediment production rates on these sites would return to present rates or less. Where seedings are successful, long-term erosion and sediment production would be reduced.

Increased vegetation density and litter resulting from reduced forage consumption would generally reduce erosion on public grazing lands in

the EIS area. Because the present erosion rate is low (Appendix E-1), the reduction would be insignificant.

Impacts on Water Resources

Combined effects of increased vegetation cover and reduction of livestock use would enhance precipitation infiltration and reduce overland runoff. The magnitude of these impacts is too small to be measured with the evaluation system employed in this study. Aquifer recharge would be enhanced due to increased infiltration. Soil and vegetation disturbance during the implementation phase of vegetation manipulation would increase overland runoff over 7 percent of the public lands. Regrowth would eliminate this runoff within three years. Bacteriological pathogens from livestock would decrease, however present levels and the anticipated magnitude of change are not known.

Reduction of livestock would decrease consumptive use of the water resources. The impact of decreased livestock use would be minor in comparison to evaporation, which accounts for the majority of surface water loss.

Impacts on Animals

Livestock

Effects of the moderate use alternative on livestock would be caused by:

(1) Modified stocking levels--most allotments would have reduced authorized use. This adjustment would require a reduction in herd size or a supplemental source of feed during the BLM grazing season.

(2) Grazing treatments--allotments under rest-seasonal treatments would not be grazed by livestock every third year. This rest would require a seasonal reduction of herd size or alternative source of feed every third year.

(3) Range Projects--vegetation manipulations would, in the long term, provide more easily accessible and higher quality and quantity forage for livestock consumption. Water developments would reduce livestock energy expended in travel and provide more accessible forage. Proposed fences and water developments would improve livestock distribution. Because present conditions are adequate to meet basic nutritional needs, improved forage quality and quantity would have insignificant effects on livestock health and production.

Wild Horses

The moderate use alternative would temporarily reduce the horse herd from its estimated present number of 20 to 16. This would essentially remove one band (one stallion and three mares per band). No comprehensive studies on minimum viable wild horse herd size are known, although Kirkpatrick (1978) indicated that in the Pryor Mountain wild horse area, a herd of 75 animals is the minimum number for breeding a healthy viable

herd. In general, however the proposed herd size of 16 is considered less than adequate for optimum herd viability under present habitat condition. A herd of 16 would be more susceptible than a larger herd to complete loss if subjected to a limiting environmental factor such as extreme drought, a winter of deep snow and extreme cold, or disease.

There would be an increased potential for injury to or death of horses during the physical roundup and removal of the excess horses. Range projects planned within the horse range would cause some temporary harassment from human and machine activities. This would result in changes in herd use patterns for a short time. Because these activities would be restricted to non-breeding and non-foaling seasons, the impacts on the horses would be minor.

Wildlife

Wildlife populations fluctuate according to a variety of environmental factors including: quantity and quality of food, cover and water; climatic conditions; disease; social interactions; predation; and human activities. Forage allocation and habitat alteration affect animal displacement, birth and death rates, and stress to animals. The total impact on wildlife populations would be a function of the various interrelationships of these environmental factors as altered by the moderate use alternative.

Many of the wildlife species in the EIS area are seasonal inhabitants, and the proposed action would only affect a portion of their life cycle. In the Mount Dome Planning Unit the public lands are scattered in many small tracts which are surrounded by private lands or other Federal lands which may or may not be managed in harmony with the adjoining public lands. Public land may be a small part of the animal's habitat and impacts of actions there may therefore be insignificant. Impacts that will be identified are those that would result in noteworthy changes in wildlife habitat or populations.

Deer and Antelope. Under the moderate use alternative, deer and antelope would be allocated 1,189 AUMs of competitive forage (Table 1-1). The bulk of the competitive forage would be allocated to deer and antelope from late winter and spring ranges.

Adjustments in livestock use are predicted to improve 25,935 acres of deer winter and spring habitat and 7,934 acres of spring antelope habitat. Habitat improvement would result from increases in forage availability, abundance, and diversity and reduced dietary competition. This improvement would benefit pregnant and lactating does of both species, which would in turn increase birth rates and fawn and kid survival and decrease death rates during late winter and early spring.

In the long-term the adjustment in livestock stocking rates coupled with the rest season treatment is expected to increase the carrying capacity on 4,461 acres of deer winter range. Under the deferred seasonal treatment

and the livestock adjustments, the carrying capacity is expected to improve on 1440 acres of antelope range and 7437 acres of deer winter range. There is inadequate information available to quantify the increases in carrying capacity in terms of population numbers, but they would help to support the California Department of Fish and Game long-term plan to increase the deer herd by 35 percent.

Although the proposed grazing treatments and adjustments in stocking rates under the moderate use alternative are expected to slightly improve carrying capacities, they are not expected to significantly change present big game range habitat condition classes within the 20-year long-term period.

Under the moderate use alternative, 2,290 acres of juniper stands would be manipulated. These manipulations would benefit deer by increasing forage. These juniper stands, however, provide high quality thermal and escape cover which, if removed totally or in expanses greater than 400 yards, would increase deer winter death rates and possibly decrease birth rates during early spring. Deer use of juniper becomes critical as winter temperatures approach 0°C. Replacing energy used for feeding and maintaining body temperatures during this period becomes more difficult (Leckenby, 1977; Bright,1977). These effects would be more evident during the short-term. Long-term effects would be beneficial as replacement vegetation starts to provide adequate thermal cover and increased forage. Big game range condition should change from poor to fair on the 2,290 acres manipulated.

Less than 10 percent of the juniper manipulation would occur within the antelope ranges, therefore impacts on antelope would be insignificant. Other vegetation manipulations have been assessed and would not significantly affect deer and antelope.

Ten reservoirs would increase water supplies for antelope and deer. These projects should improve distribution of the herbivores throughout the area, resulting in less competition between domestic and wild species.

Other Terrestrial Wildlife. Leaving 50 percent of the annual growth would increase understory production and complexity which would improve nesting cover and increase food sources. Light to moderate grazing would create small-scale environmental diversity in terms of plant density, composition, height and litter, which would benefit bird and mammal species habitat diversity (Weins and Dyer, 1975).

Juniper removal would modify habitat on 2,290 acres (10 percent of juniper association). Bird and associated predator populations which are dependent on juniper would be reduced 40 to 50 percent in both the short and long term in the project area (Hallowed, 1977, 1978, 1979; O'Meara, 1978; and Carothers and Johnson, 1975). Ground dweller populations would increase as grasses increase following juniper removal.

The proposed water developments would increase non-game habitat and allow expansion of summer habitat previously unsuitable because of limited or no water. These developments would not be expected to increase the populations in excess of 10 percent.

Threatened and Endangered Species. Implementation of the moderate use alternative would not affect the peregrine falcon or bald eagle or their habitat because livestock are physically restricted from the Mount Dome roosts. In addition, the major foraging areas for both species are located in the Klamath Basin Wildlife refuges.

Impacts on Recreation Use

Vegetation manipulations that would benefit wildlife populations, especially big game species, would increase deer and antelope sightseeing and hunting opportunities. Installation of reservoirs could also benefit waterfowl sightseeing and hunting. Improved vegetation condition and increased cover would encourage, through long term enhanced visual quality, a slight increase in visitor use. None of the consequences of the moderate use alternative would be significant relative to the area's present use.

Impacts on Cultural Resources

Cultural sites, whether achaeological, historic, or in some cases ethnographic, are fragile and non-renewable resources. Physical disturbance causes an irretrievable loss of their information potential. When the context of a site is destroyed, the most important, and virtually all scientific, data is lost, with no possibility of restoration. Gradual degradation over a period of years will eventually result in severe cumulative adverse effects. Sites deterioriate even when left only to natural (non human-induced) circumstances. The introduction of novel elements such as livestock grazing will speed up the physical alteration of cultural sites beyond the normal rate of deterioration.

Livestock grazing on cultural sites results in changes to original condition. Trampling by livestock produces three measurable impact types to archaeological materials.

Damage to Surface Specimens -- Hoof pressure on brittle, flaked-stone implements and lithic debitage results in breakage, chipping, and alteration of the original specimens. Such occurrences change or obscure original information about typology, chronology, or artifact function, leading to variations which will affect the statistics and interpretation of the impacted assemblage. In places where livestock concentrate, such as salt licks, along fences, or at watering sources, the intensity of the damage is magnified in direct proportion to the number of animals present and the length of occupation (grazing season).

Changes to Spatial Relationships -- Livestock (especially cattle and horses) cause lateral movement to specimens, displacing their original

orientation, thereby rendering inter-site activity reconstruction difficult. Again, the disturbance would be increased exponentially to the number of animals and duration of impact. Roney's (1977) experiments demonstrate that cumulative impacts could lead to total surface rearrangement, effectively destroying anthropological data.

Disturbance to Subsurface Deposits -- By repeatedly following pathways across sites, trampling the damp soil of sites around water sources, trampling moist or sparsely vegetated sites on slopes, or concentrating frequently on a particular locale, livestock cause erosion of and vertical mixing of subsurface artifacts (chronological information) and the lateral site pattern is disturbed. The disruption of subsurface deposits destroys significant environmental data, faunal specimens, and datable carbon samples associated with the artifacts at various levels.

Adoption of the moderate use alternative would benefit the protection and preservation of cultural sites by a reduction in livestock numbers, vegetation allocation (37% decrease) and a potential increase in vegetation cover compared to the present situation.

Improvement in vegetation cover would afford some protective camouflage for surface artifacts as well as reduce the erosion potential of subsurface sites and sites located on slopes.

Reduction of wild horse populations from approximately 20 to 16 would reduce trail-blazing (trampling) and trampling at water-source sites. This has been a source of archaeological disturbance increasing in proportion to the growth of wild horse herds.

Impacts on Visual Resources

Visual impacts are usually the result of: (1) soil being moved or disturbed; (2) disturbance or removal of vegetation; (3) introduction of non-native vegetation types; and (4) presence of structures. Each of these actions changes or introduces forms, lines, colors, and textures which often appear unnatural.

In the long term, each activity proposed as part of vegetation manipulation or physical projects under the moderate use alternative would meet visual resource management requirements when implementation follows BLM procedures outlined in BLM Manual 8400 (Appendix K). Activities meeting these requirements are considered to have insignificant environmental consequences.

Short-term impacts resulting from construction of the storage tank, trough, pipeline, and reservoirs and burning, seed drilling, and juniper handfelling would be greater than long-term impacts. With standard design mitigation included, the visual resource management limits would be exceeded in Class IV areas by burning and bulldozing, in Class II areas by reservoir construction and juniper felling, and in Class II areas by fence and reservoir construction and juniper felling (Appendix K-5). Other activities, although possibly having higher levels of impacts on form, line, color, and texture, would maintain the same acceptability rating as under the long-term analysis.

Long and short-term visual consequences of reduced livestock forage allocations and grazing treatments would be insignificant.

Impacts on Social and Economic Condition

The potential of BLM's management of the Mount Dome allotments to affect the livestock operator's incomes was anlayzed by estimating the dependency of the operator on livestock income and the dependency of that income on BLM forage. A 250 cow herd was assumed to be the threshold for a full-time livestock enterprise. A 10 percent forage dependency on BLM forage was used as the threshold for potentially noticeable impacts. Each alternative was evaluated for each operator to determine whether it exceeded this impact threshold.

The number of operators is less than the number of allotments because some operators are involved in more than one allotment. An operator's dependency was based on the total of all of his Mount Dome allotments and his total livstock enterprise feed requirements.

Based on a brief economic analysis and the low dependency of the livestock industry on BLM lands in the EIS area, it has been determined that there would be no significant change in income flows, employment, spending patterns, population migration, and community services. There would also be no major direct effects to the ranching sector.

The moderate use alternative would reduce grazing on BLM allotments by 37 percent (5,441 AUMs to 3,418 AUMs), but none would be cancelled. The forage reduction would be equal to about 169 head of cattle.

The two sheep operators would have their BLM forage allocations reduced by 49 percent. One operator would not be significantly affected. The other might have to reduce his herd by 20 percent. Loss of forage supply from all sources for this operator would be 4 percent.

The 10 small cattle operators would have their forage allocations reduced by 18 percent overall. One operator would increase his forage allocation by 32 percent, another by 122 percent. The others would have their forage allocations reduced by 10 to 59 percent. None of these changes would have a noticeable affect on the operators' incomes due to the combination of other income sources and low dependency on BLM forage. Loss of forage supply from all sources would be 2 percent.

The three medium operators would receive a 32-percent reduction in BLM forage. Reductions by operator would vary from 24 percent to 60 percent. Two of these operators would not be noticeably affected by these reductions. The other operator would have to reduce his herd by 12 percent (up to 54 animals). Loss of forage supply from all sources would be 2 percent.

The four large operators would have their BLM forage allocation reduced by 45 percent. By operator, these reductions would range from 14 to 52 percent. Due to these operators' low dependencies on their Mount Dome allotments, these reductions would not have a noticeable affect on their incomes. Loss of forage supply from all sources would be 1 percent.

NO ACTION ALTERNATIVE

Authorized livestock use would continue at the level leased (5,441 AUMs) since adjudication in 1966. Forage allocated for big game animals would continue at the present level of 700 AUMs. Big game and wild horse consumption, however, is about 1,429 AUMs annually. Total consumption of annual forage production would be 72 percent.

The Tablelands North Management Unit, presently under a rest rotation system, and the Tablelands South Management Unit, presently under a deferred seasonal grazing system, would remain. Additional allotment management plans would not be developed. The present stocking level, season of use, and spring seasonal grazing turnout dates would remain the same.

Existing range projects would be maintained. New water developments or seedings would not be implemented.

Impacts on Vegetation

Under the no action alternative, it is projected that present trends would continue (Table 3-5). Areas in a stable trend would remain in their present condition. In the long term (20 years), areas of improving trend or declining trend would move one condition class higher or lower respectively. Areas presently in poor condition and declining trend would continue to decline with the average acre per AUM ratio increasing from 12 to 20.

The projection of ecological condition under the no action alternative is based on the continuation of present average use which is less than authorized use. If all operators use their allotments to the full level authorized, it is assumed that, on those allotments in particular and cumulatively over public grazing lands, there would be an additional decline in condition and forage production.

Present trend acreage totals for each condition class for all public grazing lands in the EIS area are listed in Table 3-6.

TABLE 3-6
PRESENT TREND BY ECOLOGICAL CONDITION CLASS (IN ACRES)
TREND CONDITION

	Good	Fair	Poor
Improving	243	5247	1294
Stable	903	6441	2453
Declining	614	5686	6505

Applying these present trends to their present condition classes would result in the projected conditions shown in Table 3-7.

Although acre-to-AUM ratios determined by the Soil Conservation Service vary between ecological sites in the EIS area, the range between the predominant types is relatively minor.

TABLE 3-5

PREDICTED LONG-TERM CHANGES IN ALLOCATABLE FORAGE

NO ACTION ALTERNATIVE

	1979 Level	Change Due to Stocking Levels		Change Due to Vegetation Manipulation		Net Change (B+C+D+E)	Year 2000 Level (A+F)
	A	B	C	D	E	F	G
		(-)	(+)	(-)	(+)		
ECOLOGICAL CONDITION (acres)							
Poor	10,252	1,034	6,140	-	-	+5,106	15,358*
Fair	17,374	10,920	1,223	-	-	-9,697	7,677
Good	1,760	410	4,780	-	-	+4,370	6,130
Excellent	0	0	221	-	-	+ 221	221
TREND (acres)							
Declining	12,534	-	-	-	-	-	12,534
Stable	10,181	-	-	-	-	-	10,181
Improving	6,671	-	-	-	-	-	6,671
SEEDINGS (acres) **	1,022	-	-	-	-	-	1,022
PRODUCTION (AUMs)							
Allocatable forage (AUMs)	4,799	220	-	-	-	- 220	4,579

*Includes 6650 acres in presently poor condition and continuing to decline.

**Not classified by condition or trend.

TABLE 3-7
PRESENT AND FUTURE ECOLOGICAL VEGETATION CONDITION
AFTER 20 YEARS UNDER THE NO ACTION ALTERNATIVE (IN ACRES)

ALLOTMENT	EXCELLENT * FUTURE	GOOD FUTURE	GOOD PRESENT	FAIR FUTURE	FAIR PRESENT	POOR FUTURE	POOR PRESENT
Rest Seasonal							
Ericson, Don	161	318	161	10	385	663	606
Johnson, Stanley		-	-	0	504	534	30
Johnson, Dal./Hal.		-	-	-	15	42	27
Loveness Lumber		106	-	160	532	405	138
Orahood		-	-	434	434	5	5
Parsons/Rob. I		90	90	-	350	1269	919
Sub Total	161	514	251	604	2220	2917	1725
Deferred Seasonal							
Criss		-	-	-	-	452	452
Porterfield R. I		74	74	2350	3565	1464	249
Truax-Red Rock		-	-	320	-	480	800
Tablelands - S.		786	-	125	1260	515	166
Beck Ranch Inc.		507	-	125	1783	1181	30
Sub Total		1367	74	2920	6608	4092	1697
Continuous Seasonal							
Ericson, Dave		466	251	400	635	296	276
Farnam		-	-	-	-	160	160
Hadan Stock		-	-	480	480	1036	1036
Johnson Stock Co.		713	103	731	1784	1085	642
Langer		571	571	638	638	589	589
Moore		-	-	-	-	120	120
Parsons		85	189	241	356	527	308
Parsons/Rob. II		-	-	510	510	-	-
Porterfield R. II		-	-	-	-	790	790
Schader		669	-	486	1208	365	312
Sites		-	-	360	760	400	-
Smith		-	-	-	-	320	320
Sullivan		-	-	152	152	198	198
Taylor		139	15	-	124	437	437
Truax-Sheep Mt.		246	246	51	295	290	46
Sub Total		2889	1375	4049	6942	6613	4398
Rest Rotation							
Tablelands - N.	60	1360	60	104	1604	1736	1596
Sub Total	60	1360	60	104	1604	1736	1596
Totals	221	6130	1760	7677	17,374	15,358	10,252

*There is no acreage presently in excellent condition.

Using ecological site average acre-to-AUM ratios of 4 for excellent, 6 for good, 10 for fair, 12 for poor, and 20 for declining poor condition, the projected forage available for sustained allocation (50 percent of total annual forage production) can be calculated. In the long-term allocatable annual forage production would decline 5 percent from 4,799 AUMs to 4,579 AUMs.

A California Department of Fish and Game desired increase of 35 percent in the area winter deer herd would create an additional demand of 416 AUMs or a 4 percent increase over present total livestock and big game utilization. This increased consumption would slightly decrease vegetation ecological condition and forage production compared to that predicted for the existing herd size.

Impacts on Soils

Continued overgrazing on some allotments and consequent reduction in vegetation and litter would lead to long-term increased soil erosion and sediment production. In general, the increases would be insignificant. There is presently inadequate information available to predict the time required for soil erosion to become locally significant or to quantify the erosion increase.

Impacts on Water Resources

Declining range condition and reduced vegetation cover have the potential to increase runoff due to decreased infiltration. Bacteriological pathogens from livestock would continue to occur in surface water adjacent to areas of use. No significant changes from present conditions would be expected.

Impacts on Animals

Livestock

Because of present forage overallocations, overall condition and production of vegetation would continue to decline. A long-term decline in forage condition and production could reduce livestock health and production. These effects would be insignificant, however, because of the relatively short period of time that livestock remain on public grazing lands.

Wild Horses

The anticipated continuing decline of forage, even while maintaining the wild horse herd size at 20, would result in declining health of the wild horses. Herd vulnerability due to disease, extreme weather, or inbreeding would be similar to the impacts discussed under the moderate use alternative. Roundups to keep the herd from increasing over 20 would be required. Injury or death risk to horses would increase during these operations.

Wildlife

Competition by cattle, deer, and antelope on winter/spring ranges would continue. Death and birth rates are expected to increase and decrease respectively as vegetation diversity and ecological condition class decrease. Big game dependence upon private forage would increase.

Bird species diversity would decline due to decreases in vegetation cover and structural diversity. Population increases would be expected to occur in species that are adapted to poor condition ranges as more suitable habitat becomes available.

Impacts on Cultural Resources

By maintaining the existing levels of livestock grazing and wild horse population, the present unknown but measureable rate of archaeological data loss would continue. The long-term cumulative losses of cultural resources and the irretrievable commitment of the cultural data base would remain at their present rate of attrition.

Impacts on Social and Economic Conditions

Domestic livestock use of BLM public grazing land in the Mount Dome Planning Unit would be unchanged in this alternative. Livestock use and rancher dependency would be as described in Chapter 2.

PRIMITIVE USE ALTERNATIVE

Under the primitive use alternative, no livestock grazing would be authorized on public grazing lands. The wild horse herd would be allowed to increase to a population compatible with a sound ecological balance on its present range. Based on the concept of only consuming half of the yearly forage production, the maximum herd size would be about 47 animals. One hundred four miles of fencing would be constructed around public land parcels.

Impacts on Vegetation

Elimination of livestock grazing would allow increased vigor, increased litter accumulation and reproduction of individual plants at a more rapid rate than under the moderate use alternative. A potential 35 percent increase in the deer herd which uses the Mount Dome area would have a minor retarding effect on the vegetation improvements under this alternative.

The vegetation response to greatly reduced grazing by all consumers would be highly variable due to differing soil capabilities, vegetation associations, weather and the present trend away from or toward natural potential. A study in British Columbia found that it took 40 years with no livestock grazing for range in poor condition to recover through fair to good condition (McLean and Tisdale, 1972). Robertson (1971) found that denuded sagebrush-grass range ungrazed for 30 years increased 60 percent in vegetation cover. No other applicable studies in areas

comparable to the Mount Dome Juniper Steppe are known. By using professional judgment of Mount Dome soils production potential and by using the expected vegetation response of the moderate use alternative as a guide, the expected changes in allocatable forage due to the implementation of the primitive use alternative are shown in Tables 3-8 and 3-9. Long-term allocatable annual forage production would increase 47 percent from 4,799 AUMs to 7,047 AUMs.

Maintenance of the existing wildlife facilities and BLM boundary fences would have insignificant effects on vegetation. The EIS area is designated open range by the county, which means that the livestock owner is not required to confine his livestock by fencing. The public lands would require 104 miles of fence construction to prevent trespass mainly on small areas interspersed in large private operations. In the short term there would be 104 acres of vegetation removed or thinned for fence construction but in the long term the area would recover through plant succession.

Impacts on Soils

Increased vegetation and litter would reduce soil erosion and sediment production. Because of the existing low rates, the reduction would be insignificant.

Impacts on Water Resources

Anticipated increase in vegetation density would result in reduced runoff and increased infiltration. The absence of livestock would decrease consumptive use of water. The impact of no livestock use would be minimal because evaporation accounts for the majority of surface water loss.

Livestock watering would be eliminated as a beneficial use of the water resources. Other existing beneficial uses would not be affected by this alternative.

Impacts on Animals

Livestock

There would be no authorized livestock grazing under the primitive use alternative.

Wild Horses

Under primitive use the wild horse herd would be allowed to increase until big game and wild horse forage consumption equaled 50 percent of annual forage production. Predicted forage production, based on site potential, would support approximately 47 horses if there were no increased competition from big game. Under apparent present reproduction rates, the horse herd would increase from the present population of 20 to 47 in five to six years (Table 2-8). After the herd reaches the carrying capacity of its present range, additional horses would be

TABLE 3-8

PREDICTED LONG-TERM CHANGES IN ALLOCATABLE FORAGE

PRIMITIVE USE ALTERNATIVE

	1979 Level	Change Due to Stocking Levels		Change Due to Vegetation Manipulation		Net Change (B+C+D+E)	Year 2000 Level (A+F)
	A	B	C	D	E	F	G
		(-)	(+)	(-)	(+)		
ECOLOGICAL CONDITION (acres)							
Poor	10,252	7,283	0	-	-	- 7,283	2,969
Fair	17,374	17,223	7,283	-	-	- 9,940	7,434
Good	1,760	690	17,223	-	-	+16,533	18,293
Excellent	0	0	690	-	-	+ 690	690
TREND (acres)							
Declining	12,534	12,534	0	-	-	-12,534	0
Stable	10,181	10,181	3,120	-	-	- 3,120	3,120
Improving	6,671	0	19,595	-	-	+19,595	26,266
SEEDINGS (acres)**	1,022						1,022
PRODUCTION (AUMs)							
Allocatable Forage	4,799	0	2,248*	-	-	+ 2,248	7,047

*AUM calculations are based on an increase of one level in condition class. It is anticipated that AUM production would increase slightly more than indicated, but there is inadequate information to predict the additional increase.

** Not classified by condition or trend.

TABLE 3-9

PRESENT AND FUTURE ECOLOGICAL VEGETATION CONDITION
AFTER 20 YEARS UNDER THE PRIMITIVE ALTERNATIVE (IN ACRES)

ALLOTMENT	EXCELLENT FUTURE	EXCELLENT PRESENT	GOOD FUTURE	GOOD PRESENT	FAIR FUTURE	FAIR PRESENT	POOR FUTURE	POOR PRESENT
Rest Seasonal								
Ericson, Don	161	-	385	161	426	385	180	606
Johnson, Stanley	-	-	504	-	30	504	-	30
Johnson, Dal./Hal.	-	-	15	-	27	15	-	27
Loveness Lumber	-	-	532	-	138	532	-	138
Orahood	-	-	434	-	5	434	-	5
Parsons/Rob. I	36	-	404	90	679	350	240	919
Sub Total	197	0	2274	251	1305	2220	420	1725
Deferred Seasonal								
Criss	-	-	-	-	72	-	380	452
Porterfield R. I	30	-	3458	74	151	3565	249	249
Truax-Red Rock	-	-	-	-	480	-	320	800
Tablelands - S.	-	-	1260	-	-	1260	166	166
Beck Ranch Inc.	-	-	1783	-	30	1783	-	30
Sub Total	30	0	6501	74	733	6608	1115	1697
Continuous Seasonal								
Ericson, Dave	-	-	886	251	276	635	-	276
Farnam	-	-	-	-	-	-	160	160
Hadan Stock	-	-	480	-	944	480	92	1036
Johnson Stock Co.	-	-	1887	103	602	1784	40	642
Langer	229	-	980	571	589	638	-	589
Moore	-	-	-	-	-	-	120	120
Parsons	76	-	469	189	-	356	308	308
Parsons/Rob. II	-	-	510	-	-	510	-	-
Porterfield R. II	-	-	-	-	790	-	-	790
Schader	-	-	1208	-	-	1208	312	312
Sites	-	-	760	-	-	760	-	-
Smith	-	-	-				320	320
Sullivan	-	-	152	-	198	152	-	198
Taylor	-	-	139	15	355	124	82	437
Truax-Sheep Mt.	98	-	443	246	46	295	-	46
Sub Total	403	0	7914	1375	3800	6942	1434	4234
Rest Rotation								
Tablelands - N.	60	0	1604	60	1596	1604		1596
Sub Total	60	0	1604	60	1596	1604		1596
Totals	690	0	18,293	1760	7434	17,374	2969	10,252

removed. Consequences resulting from removal would be the same as discribed in previous alternatives.

Increase in herd size would improve breeding diversity and reduce risk of total herd loss through weather or disease extremes.

Wildlife

Elimination of competitive livestock grazing on spring and early summer ranges would provide increased deer and antelope forage availability and diversity. Short-term increases in higher nutritional forage would be available to deer and antelope recovering from winter stresses. These increases would benefit pregnant and lactating doe of both species and would result in increases in birth rates and fawn and kid survival and a decrease in winter-spring death rates. An increase in allocatable forage of 2,248 AUMs would occur because of elimination of livestock grazing. Increased unconsumed forage would result in increased accumulation of litter, increased plant vigor, and reproduction of plants at a more rapid rate than alternatives that recommend livestock grazing. Habitat condition trends on 22,813 acres of big game range would slowly change to stable or improving but no changes in the habitat condition class would be expected in the 20 year long term period.

There would be beneficial impacts on species such as Brewer's sparrows and sage sparrows, which are associated with improved plant species diversity, cover and height. Reduction in suitable habitat would affect species such as horned lark, Belding's ground squirrel, and vesper sparrows which are associated with poor range conditions. An increase in species populations would occur during both the short term and long term for those species benefitting from improved range condition.

Impacts on Recreation

General leisure activities such as hiking and backpacking would be enhanced by the primitive use alternative. Where wild horses are allowed to increase in number, some game species would be displaced. This would diminish hunting opportunities for big game in the wild horse areas.

Impacts on Cultural Resources

This alternative would benefit cultural resources, for the most part. Allowing wild horses to develop to their own biological limits would, however, increasingly degrade archaeological sites along wild horse trails, near water sources, and wherever the animals congregate.

The elimination of livestock grazing would benefit archaeological sites, through an increase of protective vegetative cover, slowing both illicit collecting and dislocation by erosion. Absence of livestock trampling over sites and artifacts would greatly reduce the present rate of attrition of the archaeological data base.

Restricting range projects would reduce the need for site-specific mitigation.

Impacts on Social and Economic Conditions

The reduction of livestock production would be equal to about 450 head of cattle. This would be about 1 percent of the beef cattle production in Siskiyou County. None of the ranches would become inoperable.

The loss of forage for sheep would be noticeable to one operator but not the other. The effect on the first operator would be about a 35-percent reduction in herd size to accommodate the loss of forage. Both operators would still have forage during seasons of the year they now graze on public lands in the EIS area.

None of the small cattle operators would be seriously impacted by the loss of BLM forage. The forage lost would be about 12 percent of their present total consumption from all sources. The effect of this loss would be cushioned by the fact that these operators are probably only partially dependent upon their livestock income.

The medium operators would lose about 8 percent of their total forage supply. One operator would be noticeably affected, possibly having to reduce his herd by as much as 30 percent to adjust to the reduction in his spring and fall forage supply.

The large operators would be the least affected of any of the groups because they are less dependent upon these allotments for their total forage supply. These operators would lose 3 percent of their total forage and would not be noticeably affected.

LIMITED USE ALTERNATIVE

Under the limited use alternative, 92 percent (4,411 AUMs) of the present allocatable forage would be allocated to big game and wild horses. The remaining 8 percent of forage (350 AUMs) would be allocated to livestock grazing. It is considered unlikely that allotments with six or fewer AUMs authorized for livestock would be used.

Impacts on Vegetation

The limited livestock grazing would allow increased plant vigor, litter accumulation and reproduction at a more rapid rate than for the moderate use alternative but not quite as rapid as for the primitive use alternative. Allocatable forage would increase 52 percent from the present 4,799 AUMs to 7,229 AUMs as calculated from SCS initial stocking rate guidelines (Tables 3-10 and 3-11).

The vegetation manipulations, except for juniper bulldozing and seeding and range projects as proposed in the moderate use alternative would also be implemented under limited use and contribute to increased production.

Vegetation effects associated with these activities would be the same as under the moderate use alternative.

TABLE 3-10

PREDICTED LONG-TERM CHANGES IN ALLOCATABLE FORAGE

LIMITED USE ALTERNATIVE

	1979 Level	Change Due to Stocking Levels		Change Due to Vegetation Manipulation		Net Change (B+C+D+E)	Year 2000 Level (A+F)
	A	B	C	D	E	F	G
		(-)	(+)	(-)	(+)		
ECOLOGICAL CONDITION (acres)							
Poor	10,252	7,283	0	1,549	0	- 8,832	1,420
Fair	17,374	17,223	7,283	151	1,549	- 8,542	8,832
Good	1,760	514	17,223	0	151	+16,860	18,620
Excellent	0	0	514	0	0	+ 514	514
TREND (acres)							
Declining	12,534	10,834	0	1,700	0	-12,534	0
Stable	10,181	8,761	0	0	0	- 8,761	1,420
Improving	6,671	0	19,595	0	1,700	+21,295	27,966
SEEDINGS (acres) **	1,022	0	0	0	0	0	1,022
PRODUCTION (AUMs)							
Allocatable Forage	4,799	0	2,239*	0	190	+ 2,429	7,229

*AUM calculations are based on an increase of one level in condition class. It is anticipated that AUM production would increase slightly more than indicated, but there is inadequate information to predict the additional increase.

** Not classified by condition or trend.

TABLE 3-11

PRESENT AND FUTURE ECOLOGICAL VEGETATION CONDITION
AFTER 20 YEARS UNDER THE LIMITED ALTERNATIVE (IN ACRES)

ALLOTMENT	EXCELLENT FUTURE	EXCELLENT PRESENT	GOOD FUTURE	GOOD PRESENT	FAIR FUTURE	FAIR PRESENT	POOR FUTURE	POOR PRESENT
Rest Seasonal								
Ericson, Don	161	-	385	161	606	385	-	606
Johnson, Stanley	-	-	504	-	30	504	-	30
Johnson, Dal./Hal.	-	-	15	-	27	15	-	27
Loveness Lumber	-	-	532	-	138	532	-	138
Orahood	-	-	434	-	5	434	-	5
Parsons/Rob. I	23	-	417	90	679	350	240	919
Sub Total	184	0	2287	251	1485	2220	240	1725
Deferred Seasonal								
Criss	-	-	-	-	72	-	380	452
Porterfield R. I	19	-	3620	74	249	3565	-	249
Truax-Red Rock	-	-	-	-	480	-	320	800
Tablelands - S.	-	-	1260	-	166	1260	-	166
Beck Ranch Inc.	-	-	1783	-	30	1783	-	30
Sub Total	19	0	6663	74	997	6608	700	1697
Continuous Seasonal								
Ericson, Dave	-	-	886	251	276	635	-	276
Farnam	-	-	-	-	160	-	-	160
Hadan Stock	-	-	480	-	1036	480	-	1036
Johnson Stock Co.	-	-	1887	103	602	1784	40	642
Langer	143	-	1066	571	589	638	-	589
Moore	-	-	-	-	-	-	120	120
Parsons	47	-	498	189	308	356	-	308
Parsons/Rob. II	-	-	510	-	-	510	-	-
Porterfield R. II	-	-	-	-	790	-	-	790
Schader	-	-	1208	-	312	1208	-	312
Sites	-	-	760	-	-	760	-	-
Smith	-	-	-				320	320
Sullivan	-	-	152	-	198	152	-	198
Taylor	-	-	139	15	437	124		437
Truax-Sheep Mt.	61	-	480	246	46	295	-	46
Sub Total	251		8066	1375	4754	6942	480	4398
Rest Rotation								
Tablelands - N.	60	0	1604	60	1596	1604		1596
Sub Total	60	0	1604	60	1596	1604		1596
Totals	514	0	18,620	1760	8832	17,374	1420	10,252

Impacts on Soils

Consequences would be the same as under the moderate use alternative. However, there would be no seedings to reduce erosion from 390 acres of vegetation manipulation.

Impacts on Water

Consequences of this alternative would be the same as under the moderate use alternative.

Impacts on Animals

Livestock

Livestock reductions would be greater under limited use (-93%) than under moderate use (-37%). Consequences of the reductions for remaining livestock would be similar under both alternatives.

Because all livestock grazing would be under a continuous seasonal treatment, no rest seasonal substitute feeding would be required. Allotments with six or fewer livestock AUMs would probably not be used because of marginal economic efficiency.

Wild Horses

Consequences to wild horses of the limited use alternative would be the same as under the moderate use alternative, although their habitat condition would not decline as much because of reduced livestock competition.

Wildlife

The impacts of the alternative would not vary significantly from those of the primitive use alternative.

Impacts on Recreation

The limited use alternative would have essentially the same impacts upon recreation resources as the moderate use alternative.

Impacts on Cultural Resources

Reduction in livestock numbers would have a beneficial impact on archaeological resources, resulting from less trampling of artifacts. The balance of effects of this alternative would not significantly differ from the moderate use alternative.

Impacts on Social and Economic Conditions

This alternative would authorize 381 AUMs for livestock consumption which would be a 93-percent reduction in authorized use. Eleven of the present 25 allotments would be cancelled. The remaining allotments would be reduced by at least 75 percent. The largest remaining allotment

would be authorized 69 AUMs. The reductions on all of these allotments would be so severe that most would be inoperable. In most cases the economic impacts would be the same as for the primitive use alternative. The reduction in authorized livestock use would be equivalent to reducing beef production by 421 head of cattle.

The two sheep operators would have their allocation reduced by 91 percent. Although neither of the operators' allotments would be cancelled, one would be inoperable due to insufficient AUMs.

Of the nine small operators allotments three would be cancelled. The largest remaining allotment would be the 27 AUMs. Overall, these operators would have their forage allocation reduced by 93 percent. In general, reductions of this scale would require that the BLM lands be stocked and managed separately from the adjacent private lands. This expense would probably not be justified for most of the remaining operators and they would not use the forage allocated to them.

None of the three medium operators would have their allotments cancelled. However, an overall 97-percent reduction in livestock forage would probably cause all three operators to cease using these allotments.

The four large operators would have their forage allocation reduced by 92 percent. One operator's grazing would be effectively terminated by a 1-AUM allocation. The other three operators' seven allotments would be reduced to one effectively terminated and six marginally operable.

EXCLUSIVE USE ALTERNATIVE

In each alternative, except the no action alternative, allocation of forage would be restricted to 50 percent of suitable forage. The exclusive use alternative would maximize livestock grazing by allocating all of this 50 percent of suitable current-year forage production to livestock. Although present or future big game populations would not be allocated forage under this alternative, their consumption would continue. Actual consumption of suitable forage would be 63 percent when present big game populations are included. This would leave only the remaining 37 percent of forage for watershed cover and other non-consumptive uses. Wild horses would be removed from the leased public land. The same grazing treatments and vegetative manipulations as proposed in the moderate use alternative would be implemented.

Impacts on Vegetation

There is inadequate information to directly predict the vegetation response to this alternative, but an approximate overall response can be inferred from the previously described predicted responses of the moderate use alternative (50% forage utilization) and the no action alternative (70% average forage utilization).

Studies have shown that 60 percent of annual plant growth and more can be removed from some species without interferring with the future normal growth and vigor of the plant (Hormay, 1970). It is therefore anticipated

that the 63 percent utilization rate under this exclusive use alternative, together with the beneficial effects of implementing rest seasonal and deferred seasonal treatments on selected allotments, would bring the plant communities into a stable trend, with present range ecological conditions reflecting no apparent change (Tables 3-12 and 3-13). On the 1700 acres where juniper would be removed, trend would change to improving.

The most noticeable effect of this exclusive use alternative compared to the no action alternative would be the more even distribution of livestock use and consequent vegetation response throughout the public grazing lands on individual allotments. The cumulative effect of this alternative would be of much smaller magnitude. Additional forage would also be provided through proposed vegetation manipulations and seedings (Table 3-12).

Intensive use of an area under this exclusive use alternative would be marked by a disappearance of some preferred plants or of those physiologically less resistant to grazing. Less preferred or more resistant plants may survive and replace the removed vegetation (Stoddard, Smith and Box, 1975). This would eventually lead to change in the composition and density of native plant species on a particular ecological site.

Based on the expected long term change in ecological condition, total forage production would increase by 6 percent. Without the planned vegetation manipulation, the production would remain approximately the same as at present.

Impacts on Soil

Consequences due to range projects and vegetation manipulation would be the same as under the moderate use alternative. Because vegetation would generally remain in its present condition under this alternative, soil erosion and sediment production rates would remain about the same.

Impacts on Water

The implementation phase of vegetation manipulation would increase runoff on 7 percent of the public lands until revegetation occurs. Long-term responses to this alternative would approximate existing conditions.

Impacts on Animals

Livestock

Livestock reductions would be less under exclusive use than under moderate use. Consequences of the reductions would be similar.

Wild Horses

Under this alternative, all wild horses would be removed from public grazing lands in the Mount Dome Planning Unit. Consequences to individual horses include relocation and chance of injury or death during collection.

TABLE 3-12

PREDICTED LONG-TERM CHANGES IN ALLOCATABLE FORAGE

EXCLUSIVE USE ALTERNATIVE

	1979 Level	Change Due to Stocking Levels		Change Due to Vegetation Manipulation		Net Change (B+C+D+E)	Year 2000 Level (A+F)**
	A	B	C	D	E	F	G
		(-)	(+)	(-)	(+)		
ECOLOGICAL CONDITION (acres)							
Poor	10,252	0	0	2,529	0	- 2,529	7,723
Fair	17,374	0	0	151	1,549	+ 1,398	18,772
Good	1,760	0	0	0	151	+ 151	1,911
Excellent	0	0	0	0	0	0	0
TREND (acres)							
Declining	12,534	9,854	0	2,680	0	-12,534	0
Stable	10,181	0	16,525	0	0	+16,525	26,706
Improving	6,671	6,671	0	0	1700	- 1,700	1,700
SEEDING (acres)*	1,022	-	-	0	980	+ 980	2,002
PRODUCTION (AUMs)							
Allocatable forage	4,799	0	0	0	271	+ 271	5,039

* Not classified by condition or trend.

** Future condition and trend totals are less than present because 980 acres would be converted to seedings.

TABLE 3-13

PRESENT AND FUTURE ECOLOGICAL VEGETATION CONDITION
AFTER 20 YEARS UNDER THE EXCLUSIVE ALTERNATIVE (IN ACRES)

ALLOTMENT	GOOD		FAIR		POOR	
	FUTURE	PRESENT	FUTURE	PRESENT	FUTURE	PRESENT
Rest Seasonal						
Ericson, Don	161	161	565	385	426	606
Johnson, Stanley	-	-	504	504	30	30
Johnson, Dal./Hal.	-	-	15	15	27	27
Loveness Lumber	-	-	532	532	138	138
Orahood	-	-	434	434	5	5
Parsons/Rob. I	90	90	350	350	679	919
Sub Total	251	251	2400	2220	1305	1725
Deferred Seasonal						
Criss	-	-	-	-	72	452
Porterfield R. I	225	74	3663	3565	-	249
Truax-Red Rock	-	-	-	-	480	800
Tablelands - S.	-	-	1426	1260	-	166
Beck Ranch Inc.	-	-	1783	1783	30	30
Sub Total	225	74	6872	6608	582	1697
Continuous Seasonal						
Ericson, Dave	251	251	635	635	276	276
Farnam	-	-	160	-	-	160
Hadan Stock	-	-	572	480	944	1036
Johnson Stock Co.	103	103	1784	1784	602	642
Langer	571	571	638	638	589	589
Moore	-	-	-	-	120	120
Parsons	189	189	664	356	-	308
Parsons/Rob. II	-	-	510	510	-	-
Porterfield R. II	-	-	-	-	790	790
Schader	-	-	1520	1208	-	312
Sites	-	-	760	760	-	-
Smith	-	-	-	-	320	320
Sullivan	-	-	152	152	198	198
Taylor	15	15	206	124	355	437
Truax-Sheep Mt.	246	246	295	295	46	46
Sub Total	1375	1375	7896	6942	4240	4398
Rest Rotation						
Tablelands - N.	60	60	1604	1604	1596	1596
Sub Total	60	60	1604	1604	1596	1596
Totals	1,191	1,760	18,772	17,374	7,723	10,252

Future condition totals are less than present condition totals because of 980 acres of proposed seedings that would be considered in a different category.

The effect in general would be the elimination of one isolated wild horse herd with no known distinct characteristics. The consequences of loss of this herd to wild horse preservation in general is unknown.

Wildlife

Under the exclusive use alternative, cattle would be allocated all of the allocatable forage (4,799 AUMs).

Together with the unallocated big game consumption, this would result in use of approximately 63 percent of current annual growth. Although this alternative would stabilize the ecological condition of grazing units through more even distribution of competing livestock, continued declines in big game forage availability are expected to occur on 37,595 acres of big game range. On allotments with present utilization rates above 63 percent, reducing use to the 63 percent level would slow declines in key forage availability.

Allotments with present utilization rates below 63 percent would be increased to the 63 percent level. This increase is expected to cause increased rates of decline in deer forage availability. On the average on all public grazing lands, declines in forage availability and increases in mortality and crop depredation would continue, although not as rapidly as under the no action alternative.

Impacts on Recreation

Impacts on the recreation environment under the exclusive use alternative would be essentially the same as the impacts identified under the moderate use alternative. This action would at the same time further enhance hunting and wildlife observation opportunities where competition for forage from horses would no longer be a limiting factor to wildlife.

Impacts on Cultural Resources

Adverse impacts on cultural resources related to livestock numbers would be similar to the preferred or no action alternatives. A measureable, but as yet undetermined, accumulative attrition of archaeological data would occur, similar to the present situation. Removal of wild horse herds would eliminate trampling of archaeological materials by these animals.

Impacts on Social and Economic Conditions

This alternative would reduce total forage allocated to livestock by 12 percent. This would be equivalent to reducing beef production by 54 head. Seven of the 20 operators would be allocated increased forage. No allotments would be cancelled.

The two sheep operators would have an overall livestock forage allocation reduction of 28 percent. For one of them the reduction would not be noticeable. For the other, the forage loss could cause a 15-percent reduction in the size of his herd.

Forage allocated to small cattle operators would be increased by 9 percent. The change in forage allocation by individual operators in this group would range from +175 to -50 percent. These changes would not noticeably affect these operators because of their low dependence on public lands for forage and the small scale of their livestock operations.

Medium operators would have no major change in forage allocation, although individual allotments would be increased or decreased. None of the medium size operators would be noticeably affected.

The large operators would have their forage allocation reduced by 24 percent. One operator would receive a 12 percent increase in forage allocation. The other large operators would have their forage allocations reduced by 11 to 38 percent. None of these changes would be noticeable due to the operators' low dependence upon these allotments.

MITIGATION

All mitigation proposed is described in Chapter 1 as part of the alternatives under "Standard Operating Procedures for Proposal Implementation" and in the beginning of this Chapter under "Assumptions and Analysis Guidelines".

ADVERSE ENVIRONMENTAL EFFECTS WHICH CANNOT BE AVOIDED

Unavoidable adverse environmental consequences are those remaining after application of standard operating procedures and site-specific design measures to mitigate anticipated negative effects. Except for the possible loss of the wild horse herd, none of these unavoidable effects are considered significant in terms of exceeding a threshold during the long term in the EIS area. The unavoidable consequences considered to be of greatest relative importance include the following.

Under all alternatives except primitive use and no action, there would be a short-term reduction in wildlife habitat due to vegetation manipulation. The wild horse herd would be eliminated or reduced in size.

Under all alternatives except no action, economic and management adjustments would be required of operators due to reduction or elimination of livestock use. Adverse effects on individual operators range from usually inconsequential to occassionally moderate, depending on the alternative implemented. Under the primitive use alternative all livestock use would be eliminated on public lands. Overall economic consequences under any of the alternatives would be minor because of the low dependency on public grazing lands in the EIS area.

Under the no action alternative, there would be a 5-percent long-term loss in forage available for consumption by wildlife, wild horses, and livestock. Losses of cultural resources would continue at present rates, so that irretrievable losses would be greater in the long-term.

RELATIONSHIP BETWEEN SHORT-TERM USES OF MAN'S ENVIRONMENT AND THE MAINTENANCE AND ENHANCEMENT OF LONG-TERM PRODUCTIVITY

Each of the five alternatives involves a different relationship between short-term and long-term use of the environment. The major differences result from the relative importance of the components of each alternative. The effects of these components are:

--Reduced livestock utilization through reduced allocations and treatments--The short-term reductions would require economic and management adjustments by operators. Long-term effects include improved ecological condition classes and increasing forage production, with potential increased allocations for livestock and wildlife.

--Vegetation manipulation and project construction--These activities cause short-term disruptions in wildlife, wild horses, and recreation and visual resource use. Long-term effects include better animal distribution, increased vegetation quality, and sustained forage production, with associated potential increased consumption by wildlife and livestock.

IRREVERSIBLE OR IRRETRIEVABLE COMMITMENTS OF RESOURCES

Irreversible and irretrievable commitments of resources resulting from implementation of the alternatives are described below. The term "irreversible" refers to use that which is incapable of being reversed. Once initiated, use would continue. The term "irretrievable" means essentially irrecoverable or not reasonably retrievable. Once used, the resource would not be readily replaceable.

Under the limited use, moderate use and exclusive use alternatives, vegetation manipulation and project construction would involve the following commitments:

--Energy and labor expended for projects would be irretrievable.

--Vegetation manipulations would cause the irretrievable loss of 2680 acres of juniper-associated vegetation. The loss would not be irreversible because, without further management, the juniper would return.

--With certainty under the exclusive use alternative and possibly under the moderate use, limited use, and no action alternatives, there would be an irreversible and irretrievable loss of the existing wild horse herd and its associated characteristics. Loss of a wild horse herd in general, however, would not be irreversible as wild horses from other sources could be reintroduced.

--Under all alternatives except no action, there would be a short-term irretreivable loss of forage available for livestock consumption.

Prehistoric and historic cultural resources are fragile and non-renewable. Any loss, whether inadvertent through natural processes or planned (such as salvage excavation), constitutes an irretrievable commitment of the resource. Breakage, illicit collecting, and disassociation of artifacts through erosion or trampling would constitute a loss in the present archaeological data base which is not retrievable.

ENERGY REQUIREMENTS AND CONSERVATION POTENTIAL OF ALTERNATIVES

Increased energy consumption would result during the short-term period. Vegetation manipulation and range projects would require use of power-driven equipment and extensive transportation of labor. Alternatives with more intensive long-term monitoring of range condition would require increased energy use in transportation of observers. Operators who provide substitute feed to compensate for reduced public grazing forage allocations may use more energy-intensive sources. Long-term available forage increase on public lands, however, may tend to offset initial allocation cuts. There are no known studies available to guide quantification of the energy requirements described above.

LIST AND QUALIFICATIONS OF PREPARERS

Name	Team Assignment	Education	Directly Related Experience
Donald Bateman	Vegetation and Livestock	BS Game Management Graduate study in range mgmt.	Range Conservationist (BLM) 2 years Natural Resource Specialist (BLM) 2 years Range Technician (BLM) 3 years
Dale Bays	Socioeconomics	BS Forestry Five-year graduate study in economics	Forester (BLM) 2 years Economist (BLM) 7 years
Clark Brott	Cultural Resources	BA Anthropology	Archaeologist (BLM) 3 years Anthropologist 6 years Museum Anthropologist - Archaeologist 10 years
Thomas Cottingham	Wildlife	BS Wildlife Management Graduate study in wildlife	Wildlife Biologist (BLM) 1 year
Robert Fay	Wild Horses	BS Range Management	Range Conservationist (BLM) 9 years Resource Area Manager (BLM) 7 years
Sue Grobman	Editor	BA English Literature	EIS Editor/Coordinator (USGS) 3 years Editorial Coordinator (BLM) 5 years
Maureen Hales	T&E Plants	BS Biology MS Biology/Plant Ecology	Botanist (BLM) 4 years
Ted Klaseen	Soils	AB Economics BS Soil Science	Soil Scientist (BLM) 3 years Soil Scientist (SCS) 15 years Farmer 12 years
Robert Korfhage	Technical Coordinator	BS Range Management MS Range Wildlife Habitat	Wildlife Mgmt. Biologist (BLM) 2 years Environmental Coordinator (BLM) 3 years
William Lawhorn	Wildlife	BS Wildlife Management	Wildlife Biologist (BLM) 4 years Wild Horse Specialist (BLM) 3 years Ass't. Refuge Manager (F&WS) 4 years

Gary Shellhorn	Air and Water	BS Watershed Management	Hydrologist (BLM) 5 years
John Simmons	Geology	BS Geology	Geologist (BLM) 6 years
Philip Stanbro	Team Leader	MA Geography	Environmental Specialist (BLM) 1 year Environmental Consultant 2 years
Joseph Williams	Recreation	BS Outdoor Recreation	Outdoor Recreation Planner (BLM) 6 years
Carl Zulick	Visual Resources	MLA Landscape Architecture	Landscape Architect (BLM) 2 years Landscape Architect 4 years

AGENCIES, ORGANIZATIONS, AND PERSONS
TO WHOM COPIES OF THE STATEMENT ARE SENT

Federal Agencies

Department of the Interior
National Park Service
Fish and Wildlife Service
Water and Power Resources Service

Department of Agriculture
U.S. Forest Service
Soil Conservation Service

Environmental Protection Agency
Advisory Council on Historic Preservation
Bonneville Power Administration

California State Agencies

Office of Planning and Research - State Clearinghouse
Department of Fish and Game
Water Resources Department
Division of Mines and Geology
Lands Commission
Air Resources Board
Native American Heritage Commission
University of California, Agriculture Extension Service
Office of the State Historic Preservation Officer

Local Governments

Boards of Supervisors and Departments of Agriculture, Modoc and Siskiyou Counties
City Council of Dorris
City Council of Tulelake

Other Organizations

Butte Valley Chamber of Commerce
California Association of Four Wheel Drive Clubs
California Cattlemen's Association
California Native Plant Society
California Natural Areas Coordinating Council
California Wool Growers Association
College of the Siskiyous
Glass Mountain 4 Wheelers
McCandless & Barrett (Attorneys for American Horse Protection Assoc., Inc.)
Modoc County Cattlemen's Association
National Audubon Society
Natural Resources Defense Council
Northern Counties Wildlife Conservation Association
Northern Klamath River Chamber of Commerce

Pacific Gas and Electric Co.
Pacific Power and Light Co.
Planning and Conservation League
Shasta Cascade Wonderland Association
Sierra Club
Siskiyou County Cattlemen's Association
Wild Horse Organized Assistance

Individuals

EIS Livestock Operators
Boyd Pitman
Willis Slavens
Barbara Powers
Patti Easterla
J. Tom Meador
David D. Smith and Associates

PUBLIC INVOLVEMENT

Following the initial development of alternatives for the Mount Dome Livestock Grazing Management Plan and prior to preparation of the related EIS, public involvement was promoted. Through the media and using a mailing list of 79 agencies, 79 groups, and 92 individuals, the public was notified of the proposed action and of planned public meetings. Thirty-five of those notified indicated a desire to remain on the EIS mailing list.

During the November public meetings in Dorris and Tulelake, California, twenty individuals, representing seven Mount Dome livestock operators and four agencies, attended. The following concerns related to the plan were identified:

- Loss of potentially valuable grazing land due to juniper intrusion.
- Need for development of water supples and storage facilities.
- Need for range reseeding.
- Reassignment of leases where forage is not being utilized to authorized level.
- Lack of consideration for adjacent ranchers supplying feed for winter deer herd; possible control of sizes of deer herds.
- Interest in letting some wildfires burn in order to convert vegetation.
- Need for coordination with BLM Lakeview District and USFS when operators lease from two agencies.
- Conflicts between wildhorse herd and livestock.

On March 13, 1980, further information on the EIS was sent to parties on an updated Mount Dome mailing list and released through the media. The information included the concerns noted above and a restatement of the five alternatives, including improvements and forage allocations by allotment. There was one response to this information, from the attorneys for the American Horse Protection Association, who expressed opposition to reduction in size of the wild horse herd.

GLOSSARY

ACRE/AUM - - The numbers of acres of forage required to support a cow and calf for one month. See also ANIMAL UNIT MONTH.

ACTUAL USE - - The consumption of forage on a given area by livestock and/or game animals. Usually expressed in terms of animal unit months.

AQUATIC VEGETATION - - Plants of all types that grow rooted in wet areas such as ponds and springs.

ALLOCATABLE FORAGE - - Fifty percent of the current year's growth of all browse and herbaceous foods, plus cheatgrass and domestic seedings, that are available.

ALLOTMENT - - An area designated for the use of a prescribed number, season and kind of livestock under one plan of management. May include parcels of privately owned lands.

ALLOTMENT MANAGEMENT PLAN (AMP) - - A concisely written program of livestock grazing management, including supportive measures, if required, designed to attain specific management goals in a grazing allotment.

ANIMAL UNIT MONTH (AUM) - - The forage needed to support one cow and its calf, one horse, five sheep, five deer, or seven antelope for one month (equivalent to 1000 pounds of dry weight forage).

ANNUALS - - Plants produced from seed which complete their life cycle in one growing season.

AVAILABLE FORAGE - - All browse and herbaceaus foods that are available to grazing animals. In this EIS, forage also includes cheatgrass and domestic grassland seedings.

BROWSE - - As an adverb, to consume or feed or eat on woody plants; as a noun, the tender leaves, buds and twig of trees and shrubs used as food by cattle, deer, elk, and other animals.

BROWSER - - An animal that feeds on leaves, buds and twigs of woody plants.

BUCKING - - To saw a felled tree into lengths.

BULLDOZING -- Using a crawler tractor with a blade to push over and move vegetation.

CLIMAX VEGETATION - - The highest ecological development of a plant community capable of perpetuation under the prevailing climatic and soil conditions.

CONTINUOUS SEASONAL GRAZING - - Grazing a unit less than a full year with no rotation among pastures.

COVER (PLANT) - - The combined aerial parts of plants and mulch.

COVER (SOIL) - - Small rocks, litter, basal areas of grass and forbs, and aerial coverage of shrubs that provide protection to the soil surface.

COVER (WILDLIFE) - - The plants, or other objects used by animals for nesting, resting, escaping from predators or to avoid adverse environmental conditions.

CRITICAL WILDLIFE HABITAT - - That portion of the living area of a wildlife species that is essential to the survival and perpetuation of the species either as individuals or as a population.

DEFERRED SEASONAL GRAZING - - Systematic rotation of pastures during the grazing season. All pastures are grazed seasonally.

DENSITY (PLANT) -- The number of vegetation individuals per unit area. Refers to the relative closeness of individuals to one another.

DENSITY (WILDLIFE) - - Number of individuals per unit area.

DIETARY OVERLAP - - The number or amount of food plants that are found to be common to the diets of two or more species of plant eating animals. The overlap varies with the time of the year and species of animal.

ECOLOGICAL CONDITION CLASS - - See RANGE SITE CONDITION CLASS.

ENDANGERED SPECIES - - Any species which is in danger of extinction throughout all or a significant portion of its range.

FORB - - Herbaceous plants neither grass nor resembling grass.

GRAZING TREATMENT - - A period of grazing or deferment from grazing on one or more pastures at a set stocking level. Types of treatment include rest seasonal, rest rotation, deferred seasonal, and continuous seasonal.

HAND FELLING - - The use of chainsaws on thinning invading juniper.

KEY SPECIES - - Forage species which serve as indicators of the plant community condition and trend.

LESSEE - - One who has specified livestock grazing rights or privileges under a grazing lease.

LITTER - - The uppermost layer of undecomposed plant dead material on or near the soil surface.

OPEN RANGE - - Range on which the livestock owner is not required to confine his livestock by fencing.

OPERATOR - - See LESSEE.

PASTURE - - A grazing area enclosed and separated from other areas by a fence.

PERENNIAL - - A plant that has a life cycle of three or more years.

PHENOLOGY - - The study of periodic biological phenomenon such as flowering or seeding. Used in determining grazing turnout dates.

PLANT ASSOCIATION - - A plant association is a type of plant community of definite composition, presenting a uniform appearance and growing in uniform habitat conditions.

PRESCRIBED BURNING - - The use of fire as a management tool under specified conditions for burning a predetermined area.

PUBLIC GRAZING LAND - - Lands on which grazing is administered by the BLM.

PUBLIC LAND - - Lands totally administered by the Bureau of Land Management.

RANGE READINESS - - The defined stage of plant growth at which grazing may begin without permanent damage to vegetation or soil.

RANGE SITE - - A distinctive kind of rangeland that differs from other kinds of rangeland in its potential to produce native plants. Used to determine production potential of areas with similar soil type.

REST ROTATION GRAZING - - An intensive system of management whereby grazing is deferred on various parts of the range during succeeding years allowing the deferred part complete rest for one year.

REST SEASONAL GRAZING - - One pasture or one allotment rested season long, In the Mount Dome Unit, allotments would be rested every third year.

SECTION 7 CONSULTATION - That section of the Endangered Species Act of 1973 (16 U.S.C. 1531) that requires any agency to consult with the Director of the Fish and Wildlife Service on any action that may impact an endangered or threatened plant or animal species.

SEED DRILLING - - Planting seed with a drill in relatively narrow runs, generally less than a foot apart.

STABLE TREND - - Vegetation which shows no apparent direction of change in range condition.

STAND - - A group of plants growing together on a contiguous area.

SUSTAINED YIELD - - The amount of plant or animal material that can be removed or harvested from the plant or animal population without damaging that populations productive capabilities.

THREATENED SPECIES - - Any species likely to become endangered within the forseeable future throughout all or a significant part of its range.

TRANSECT - - A sample area of vegetation or animals, usually in the form of a narrow continuous strip, that is used especially for the tabulation of data (frequency, size or yield of different species, etc.).

TREND - - The direction of change in range condition.

UNDERSTORY - - Plants growing beneath the canopy of other plants.

UTILIZATION - - The proportion of current year's forage production that is consumed or destroyed by grazing animals. Usually expressed as a percentage.

VIGOR (PLANTS) - - The state of health or a plant. The capacity of plants to produce and store food and produce seed.

VISUAL RESOURCES MANAGMENT (VRM) - - The planning, design, and implementation of management objectives to provide acceptable levels of visual impacts for all BLM resource management activities.

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APPENDIX A

METHODOLOGY USED TO DETERMINE THE FORAGE PRODUCTION IN THE MOUNT DOME EIS AREA

Inventory Method

During the spring and summer seasons of 1978, beginning at lower elevations, BLM personnel collected field data using a modified form of the Soil-Vegetation Inventory Methods (SVIM) from BLM Manual 1731.

Precipitation recorded during the water year (October 1, 1977 to September 30, 1978), at nearby Mount Hebron, was 18 percent higher than the mean for that location. In the preceeding year (1976-77), precipitation was below the station mean by 49 percent.

Initially, soil units were mapped in 1977-78 on aerial photographs. Field studies led to a subdivision of the soil units into vegetation types based on plant composition, age, and relative abundance. Within each vegetation type a linear point transect of 100-200 points was established through the longest axis of the vegetation type. The step point (toe point) method was used to determine the composition of ground cover and frequency. At a predetermined number of paces, the ground cover was recorded as observed in a notch cut into the sole of the boot toe. Both basal and tree-shrub canopy cover were recorded. Twenty circular 1/400-acre vegetation characteristic plots were taken at equal intervals along the predetermined transect. Density of each plant species was estimated and grasses were measured in basal inches and height.

Shrubs in the plot were aged by cross-sectioning and their height was recorded. Juniper trees were aged by increment core-boring and the height was measured with a clinometer. Canopy in the plot was estimated for both shrubs and trees. The phenology stage of each plant was also recorded. One of seven form classes (vigor) was assigned to each plant: normal or vigorous, dying center, hollow center, clump edge, dead, decadent or resprout. Availability classes for deer and livestock were also assigned.

Calculation of Native Forage Production

Initial livestock stocking levels are based on natural vegetation production potential. These levels are developed through the use of individual range site guides prepared by the Soil Conservation Service for eight ecological sites found in the Mount Dome EIS Area (USDA, SCS, 1978). By using the estimated percent composition of native vegetation and referencing the range site guide, the ecological condition class was determined for each vegetation type on a particular soil. (See Appendix C for ecological site descriptions.)

Four classes are used to express the degree to which the composition of the present plant community reflects that of the potential natural vegetation. They are:

Ecological Condition Class	Percentage of Present Plant Community Associated with climax range condition for Range Site
Excellent	76-100
Good	51-75
Fair	26-50
Poor	0-25

When the range condition class is determined for a particular soil, the initial stocking rate is determined from the SCS stocking rate tables. These tables provide for a 50 percent withholding for non-consumptive values and plant maintenance. The example below is for a Shallow Stony Loam Class.

GUIDE TO INITIAL STOCKING RATE (AC/AUM)

Condition	AC/AUM (10"-12") precip. zone	AC/AUM (12"-14") precip. zone
Excellent	4-5	3-4
Good	5-7	4-6
Fair	7-12	6-11
Poor	12+	11+

Additional AUM allocations which included 20 percent of the annual cheatgrass production, additional bottlebrush squirreltail on the North Tablelands Unit, and domestic seedings were added to the initial stocking rate. The following three examples demonstrate these additional allocations on hypothetical allotments.

EXAMPLE I -- Cheatgrass Allocation

The objective is to allocate, for livestock grazing, 20 percent of the total non-native cheatgrass which would not be allocated under the SCS range site system. The hypothetical allotment is composed of 1798 acres suitable for grazing. From field sampling (BLM and SCS, 1978) in the EIS area and a literature search (Klemmendson and Smith, 1964, p. 264), cheatgrass production averages approximately 100 pounds air dry weight per acre in years of normal precipitation. One AUM is equivalent to 1000 pounds air dry forage. The available native vegetation under the SCS range site system for this allotment is rated at 284 initial AUMs.

$$\text{Cheatgrass AUMs} = \frac{\text{Suitable acres } 100 \text{ cheatgrass } 20\%}{1000 \text{ AUM}}$$

$$\text{Cheatgrass AUMs} = \frac{1798 \text{ acres } 100 \ .20}{1000 \text{ AUM}}$$

Cheatgrass AUMs = $\frac{179800 \ .20}{1000 \text{ AUM}}$ = 36 AUMs

Cheatgrass AUMs = 36

Total initial allocation 36 + 284 = 320 AUMs

EXAMPLE II -- Additional Squirreltail Allocation For North Tablelands AMP

In the North Tablelands allotment the volume of squirreltail grass (Sitanion hystrix) is as high as 41 percent of the total vegetation production in small scattered areas. Range site descriptions on specific soil types indicate that only a 5-percent composition by weight of squirreltail should be available. Therefore, the difference between 5 percent and the actual composition was calculated for additional utilizable AUMs. The following calculations were used in allocating additional squirreltail above the 5 percent range-site level on non-domestic seeded areas.

Pasture I--Squirreltail average density 24%
730 suitable
Squirreltail = 200 LBS/AC (average determined from BLM sampling).

$$\frac{730 \ 200 \ (.24-.05)}{1000} = \frac{2774}{1000} = 28 \text{ AUMs}$$

Pasture II--Squirreltail average density 25%
931 suitable

$$\frac{931 \ 200 \ X \ (.25-.05)}{1000 \text{ AUM}} = \frac{37240}{1000} = 37 \text{ AUMs}$$

Pasture III---Squirreltail average density 15%
1500

$$\frac{1055 \ X \ 200 \ (.15-.05)}{1000 \text{ lbs/AUM}} = \frac{30,000}{1000} = 30 \text{ AUMs}$$

Total Squirreltail AUMs allocated = 95

EXAMPLE III -- Domestic Seeding Allocation

The following factors are considered in determining the forage available for utilization from domestic seeding sites.

Average percent composition by plant species was computed from plant frequency along a 200-point transect. Average percent composition ignores bare ground, rock, etc., and is based on 100 percent of the total vegetation present.

Proper use for seeded wheatgrasses is usually 50 percent of the current year's growth which can be utilized without disrupting the plant's maintenance needs. Plant density (percent of ground cover) data were collected using the step point method. This involved pacing off 200 points across the longest axis of the seeding. At each point along the transect, a reading was made by recording the number of hits in a notch cut into the tabulator's boot. These vegetation hits were then tabulated to give plant density.

Percent utilizable is a deduction usually made for distance to water, rock and slope. This deduction is zero in Mount Dome seedings because these site limitations do not exist.

The forage acre requirement (FAR) (acre per AUM) is based on the production of a particular plant species under selected physical conditions and actual use. The FAR was taken from tables developed specifically for the Mount Dome Planning Unit in 1963.

The following calculations were performed for each domestic seeding because the ecological range sites used in native forage calculations are not applicable.

Cattle-Spring Use

Species	% Composition	Proper Use of Plant			
Intermediate wheatgrass	42	X	50	=	.210
Crested wheatgrass	46	X	50	=	.230
Cheatgrass	12	X	20	=	.024
TOTAL	100				.464 AVG. PROPER USE

Species proper use factor (PUF) X percent composition = average PUF

Total Avg. PUFs (.464) X Average Density (.47) = Forage Acre Factor (.218)

Forage acre factor (.218) x percent of acres utilizable (100) = net forage acre factor (.218)

Forage acre requirement (.4): net forage

Acre (.218) Factor = Acres/AUM (1.83)

Seeding Acres (330): Acres/AUM (1.83) = 180 AUMs

The seeding AUMs are then added to the total native plant sub-type AUMs to determine the total AUMs for the allotment.

The year following the basic vegetation inventory (1979) two cage-protected plots were clipped per seeded pasture to measure the production available during the spring season of use. Taking climatic factors into consideration, comparable production results were found.

APPENDIX B

RANGE SUITABILITY CRITERIA USED IN DEVELOPING PROPOSED ACTION

TABLE 1

SUITABILITY DETERMINATIONS

Slope Percent		Distance Up Slope	Suitable	Unsuitable
0%-20%	--	to 40 miles	X	
21%-30%	--	to 0.6 miles	X	
		over 0.6 miles		X
31%-40%	--	to 0.5 miles	X	
		over 0.4 miles		X
41%-50%	--	to 0.3 miles	X	
		over 0.3 miles		X
51%	--			X

TABLE 2

RANGE SUITABILITY STANDARDS FOR BLM

SUITABILITY ELEMENT	ALLOWABLE VARIATION Low	Recommended	High	All Range Classes Suitability	Exceptions for Ephemeral and Perennial Ephemeral Ranges
1. Percent slope is greater than		50%		U	
1. Percent slope is less than		50%			
2. Current production of usable perennial forage is not sufficient to provide grazing capacity of less than		32 Ac/AUM			
3. Potential production (either through management or treatment) of usable perennial forage is not sufficient to provide grazing capacity of less than		32 Ac/AUM		U	May be classed as having "Limited Suitability" if all other suitability criteria are met. Go through key from number 4.
3. Potential production (either through management or treatment) of usable perennial forage is sufficient to provide grazing capacity of less than		32 Ac/AUM			
4. Present SSF is greater than		60 SSF			
5. Potential SSF is greater than . . .		60 SSF		U (erosion)	
5. Potential SSF is less than		60 SSF			
6. Potential SSF is more than . . .		40 SSF			
7. Slope greater than		20%		U (erosion)	
7. Slope less than		20%		PS (erosion)	
6. Potential SSF is less than . .		40 SSF		To Table 1 (erosion)	
4. Present SSF is less than		60 SSF			
8. Present SSF more than (less than 60)		40 SSF			
9. Potential SSF more than (less than 60)		40 SSF			
10. Slope greater than		20%		U (erosion)	
10. Slope less than		20%		PS (erosion)	
9. Potential SSF more than (less than		40 SSF		To Table 1 (erosion)	
8. Present SSF less than		40 SSF		To Table 1 (low Prod)	Limited Suitability
2. Current production of usable perennial forage is sufficient to provide grazing capacity of less than		32 Ac/AUM			
11. Present SSF is greater than		60 SSF			
12. Potential SSF is greater than		60 SSF		U (erosion)	
12. Potential SSF is less than		60 SSF			
13. Potential SSF is more than. . . .		40 SSF			
14. Slope greater than		20%		U (erosion)	
14. Slope less than.		20%		PS (erosion)	
13. Potential SSF less than		40 SSF		To Table 1 (erosion)	
11. Present SSF is less than		60 SSF			
15. Present SSF more than (less than 60)		40 SSF			
16. Potential SSF more than		40 SSF			
17. Slope greater than		20%		U	
17. Slope less than		20%		PS (erosion)	
16. Potential SSF less than		40 SSF		To Table 1 (erosion)	
15. Present SSF less than		40 SSF			
18. Distance from reliable water is more than		4 miles		To Table 1 (water)	
18. Distance from reliable water is less than		4 miles		To Table 2	

APPENDIX C

INDEX TO ECOLOGICAL SITES

ECOLOGICAL SITES	SOIL SERIES	PLANT ASSOCATIONS
Loamy	Langer Falvey Hammond Drews Calimus O'Keeffe	Bluebunch Wheatgrass/Big Sagebrush
Shallow loamy	Keating Devon Porterfield	Bluebunch Wheatgrass/Low Sagebrush
Loamy hardpan	Salisbury	Bluebunch Wheatgrass - Idahoe Fescue/Big Sagebrus
Sandy	Stukel Dome------	Indian Ricegrass-Needlegrass/Big Sagebrush
Very shallow stony loam	Lequieu --	Bluebunch Wheatgrass/Low Sagebrush
Shallow stony loam	Lorella Devon-----	Bluebunch Wheatgrass/Low Sagebrush
Stony loam	Wrantham O'Keeffe Cleri-----	Bluebunch Wheatgrass/Big Sagebrush
Clay Basin		Mat Muhley/Perennial Forbs/Silver Sage

Source: Soil Survey of the Mount Dome Planning Unit, Soil Conservation Service, 1978.

APPENDIX D

ACRES OF SOIL MAPPING UNITS AND RANGE SITES FOR AREAS UNDER GRAZING

Map Symbol	Series Names	Acres	%	Range Sites
100	Devan-Keating	3575	9.1	Shallow Loamy Loamy
110	Hammond-Porterfield	1800	4.6	Loamy Shallow Loamy
121	Calimus	655	1.7	Loamy
130, 131	O'Keeffe-Calimus	1678	4.3	Loamy
140	Salisbury-Langer	1548	3.9	Loamy Hardpan Loamy
160, 161	Dome-Stukel	1432	3.7	Shallow Sandy
170, 700	Rubbleland, Rockland	796	2.0	_____
190	Lequieu-Falvey	302	0.8	Very Shallow Stony Loam Loamy
200	Wrentham-Rubbleland	394	1.0	Stony Loam
211, 214	Drews	319	0.8	Loamy
220, 1343, 1361	Lorella-Clerf	18,008	45.8	Shallow Stony Loam, Stony Loam
241	Inlow-Somerset	509	1.3	Saline Bottoms
1363	Unnamed	1057	2.7	Stony Loam
1364	"	618	1.6	Shallow Stony Loam
1365	"	421	1.1	Loamy
1365v	"	111	0.3	Loamy
1368	"	1351	3.4	Stony Loam
1368v	"	649	1.7	Stony Loam
1369	"	479	1.2	Sandy
1371	"	575	1.5	Stony Sandy
1375	"	661	1.7	Shallow Stony Loam
Unmapped		594	1.5	
		37,532	95.7	

APPENDIX E-1
SOIL CHARACTERISTICS

MAP UNIT SYMBOL	SOIL SERIES AND PHASE NAME 1/	PERM-EABIL-ITY 1/	SOIL REACTION pH	RUN-OFF 1/	DRAINAGE	WATER EROSION HAZARD	PSIAC SED/YIELD AF/SM 3/	TEXTURE SURFACE SUBSOIL 2/	DEPTH RANGE INCHES	UNDER-LYING MATERIAL	AWC 1/	HYDRO-LOGIC GROUP 1/	RANGE SITE 1/
100	Devon loam 0-5% slopes	M S	6.1-7.8	S	Well	Slight	0.20	loam,clay loam clay loam,clay	10-20	Extrusive Igneous Rock	VL or L	D	Shallow Loamy
100	Keating loam 0-5% slopes	S	6.6-7.8	S	Well	Slight	0.24	clay loam clay loam,clay	20-40	" "	L or M	C	Loamy
110	Hammond loam 15-30% slope	M	6.1-7.3 7.4-7.8	R	Well	H	0.40	Loam Loam	20-40	Diatomite & Volcanic Ash	L or M	B	Loamy
110	Porterfield loam 15-30% slopes	M	6.1-7.3 7.4-7.8	R	Well	H	0.42	Loam Loam	10-20	" "	VL or L	C	Shallow Loamy
121	Calimus loam 0-5% slopes	M	6.6-7.3 6.6-8.4	S	Well	Slight	0.13	Loam Loam	60 +	Alluviam	H	B	Loamy
130	O'Keefe cobbly loam 0-5% slopes	M	6.6-7.8	S	Well	Slight	0.11	Loam Loam	20-40	Extrusive Igneous Rocks	L or M	B	Loamy
130	Calimus loam 0-5% slopes	M	6.6-7.3 6.6-8.4	S	Well	Slight	0.11	Loam Loam	60 +	Alluvium	H or VH	B	Loamy
131	O'Keefe cobbly loam 30-75% slopes	M	6.6-7.8	R or VR	Well	H to VH	0.30	Loam Loam	20-40	Extrusive Igneous Rock	L or M	B	Loamy
131	Calimus loam 30-75% slopes	M	6.6-7.3 6.6-8.4	R or VR	Well	H to VH	0.38	Loam Loam	60 +	Alluvium	H or VH	B	Loamy
140	Salisbury loam 0-9% slopes	S	6.6-7.3	S or Med	Well	Slight or M	0.155	Loam Clay	20-40	Hardpan over Rock	L or M	C	Loamy Hardpan
140	Langer clay loam 0-9% slopes	M S	7.4-8.4 7.9-8.4	S or Med	Well	Slight or M	0.15	Clay loam Loam	40-60	Hardpan over Rock	H	B	Loamy
160	Dome V St loam 15-50% slopes	M R	6.6-7.3	R	Somewhat excessive	H	0.29	Loam Loam	10-20	Extrusive Igneous Rock	VL	C	Shallow Sandy
160	Stukel V St loam 15-50% slopes	M R	6.6-7.3	R	Somewhat excessive	H	0.26	Loam Loam	10-20	" "	VL	C	Shallow Sandy

APPENDIX E-1 (con't.)

MAP UNIT SYMBOL	SOIL SERIES AND PHASE NAME 1/	PERM-EABIL-ITY 1/	SOIL REACTION pH	RUN-OFF 1/	DRAINAGE	WATER EROSION HAZARD	PSIAC SED/YIELD AF/SM 3/	TEXTURE SURFACE SUBSOIL 2/	DEPTH RANGE INCHES	UNDER-LYING MATERIAL	AWC 1/	HYDRO-LOGIC GROUP 1/	RANGE SITE 1/
161	Dome sandy loam 2-15% slopes	M R	6.6-7.3	R	Somewhat excessive	H	0.35	Sandy loam Sandy loam	10-20	Extrusive Igneous rock	VL	D	Shallow Sandy
161	Stukel sandy loam 2-15% slopes	M R	6.6-7.3	R	Somewhat excessive	H	0.32	Sandy loam Sandy loam	10-20	" "	VL	D	Shallow Sandy
170	Rubbleland	-	-	-	-	-	0.185	- -	-	" "	-	-	-
190	Lequieu V St loam 0-5% slopes	M	6.6-7.3	VS or S	Somewhat excessive	Slight	0.13	Loam Loam	10	" "	VL	C	V Shallow St loam
190	Falvey loam 0-5% slopes	MS	6.6-7.8 7.4-7.8	S or Med	Well	Slight or M	0.14	Loam clay loam	20-40	" "	M	C	Loamy
200	Wrentham V St loam 15-50% slopes	M	6.6-7.3	Med or R	Well	M or H	0.255	Loam Loam	20-40	" "	M	C	St loam
200	Rubbleland	-	-	-	-	-	0.185	-	-	-	-	-	-
211	Drews loam 2-5% slopes	MS	6.1-7.3 7.9-8.4	S	Well	Slight	0.13	Loam clay loam	60 +	Alluvium	H	B	Loamy
214	Drews loam 15-30% slopes	MS	6.1-7.3 7.9-8.4	Med or R	Well	Slight	0.13	Loam clay loam	60 +	" "	H	B	Loamy
220	Lorella V St loam 5-30% slopes	VL or L	6.6-7.3	Med or R	Well	M or H	0.225	Loam clay loam	14-20	Extrusive Igneous Rock	L	D	Shallow St loam
220	Clerf V St loam 5-30% slopes	M	6.6-7.8 6.6-8.4	Med or R	Well	M or H	0.225	Loam clay loam	20-40	" "	L or M	C	St loam
241	Inlow loam 0-5% slopes	M	7.9-8.4	S	MS	Slight	0.11	Loam loam,clay loam	20-40	Hardpan	M	C	Saline Bottoms
241	Somerset loam 0-5% slopes	MS	6.6-7.3 7.9-8.4	S	MS	Slight	0.11	loam Clay loam	20-40	Hardpan	M	C	Saline Bottoms

1/ H = High, L = Low, M = Moderate, Med = Medium, R = Rapid, S = Slow, St = Stony, V = Very

2/ First entry is for surface layer, second layer is for subsurface layer.

3/ AF/SM = acre feet per square mile. One acre foot of sediment equals 4,000,000 lbs. or 2,000 tons.

Sediment yield data calculated by using procedures in BLM Manual 7313 - Erosion. All other data in this table is from Soil Survey of the Mount Dome Planning Unit, Soil Conservation Service, 1978.

APPENDIX E-2

SOIL SYMBOLS AND PHASES WITH SELECTED BEHAVIOR CHARACTERISTICS AND PRODUCTIVITY ESTIMATES

Soil Series Number Name	Soil Phase Symbol [1]	Permeability [2]	General Drainage [3]	Erosion Hazard [4]	Hydrologic Soil Group [5]	Estimated Suitability for Extensive Range Use [6]
700 [7]		Rapid to impermeable	Excessively to well	-	-	Unsuitable
1343 Lorella	1R3, 2R2, 2R3, 2S3, 2R4	Slow	Well	Moderate	D	Very low
1361 Clerf	2R4	Slow	Well	Moderate	C	Unsuitable to Very low
1361 Clerf	2R2, 2R, 2R3	Moderately Slow	Well	Moderate	C	Very low to Low
1361 Clerf	3R, 3R2, 3R3	Moderately Slow	Well	Moderate	C	Low
1361 Clerf	2R1, 3R1, 3S3	Slow	Well	Moderate	C	Very low to Medium
1363	2R3, 2R2, 2R1, 3R2	Moderate	Well	Moderate	C	Very low to Medium
1363	3, 3R1	Moderate	Well	High	C	Low to Medium
1364	1, 1R1, 2R3, 2R	Rapid	Excessively	High	D	Low
1364	2, 2R1	Rapid	Somewhat Excessively	High	D	Low to Medium
1365	2, 3, 4	Moderately Rapid	Well	High	B	Medium
1365V	2, 3, 4	Moderately Rapid	Well	High	B	Low to Medium
1368	4R1, 4R2, 4R3, 5R3	Moderate	Well	Moderate	C	Low to Medium
1368V	3S2, 3R1, 3R2, 3R3	Moderate	Well	Moderate	C	Very low to Medium

APPENDIX E-2 (cont.)

Soil Series Number Name	Soil Phase Symbol 1/	Permeability 2/	General Drainage 3/	Erosion Hazard 4/	Hydrologic Soil Group 5/	Estimated Suitability for Extensive Range Use 6/
1369	2R1, 2R3, 2R, 3R1, 3R2, 3R3	Moderately Rapid	Well	High	B	Low to Medium
1369	4R1, 4R2	Moderately Rapid	Well	High	B	Low to Medium
1371	3R2, 4R2	Moderately Rapid	Well	High	B	Low
1375	1R4, 2R2, 2R3, 2R4	Moderately Slow	Well to Somewhat Excessively	High	D	Very Low to Low

APPENDIX E-2 Footnotes

1/ Phase symbols listed here are:

Depth Class	Depth (feet)	Symbol	Surface Rock (Percent)	Symbol	Stoniness-percent coarse fragments gravel, cobbles, and stones by volume in the soil.
Very Shallow	1	R	10-50	S1	less than 20
Shallow	1-2	R1	2-10	S2	20-50
Moderately Shallow	2-3	R2	10-25	S3	50-90
Moderately Deep	3-4	R3	25-50		
Deep	5	R4	50-90		

2/ Permeability: rate of water movement through the soil profile. Relative terms used, based on the least permeable layer within or directly beneath the soil after prolonged wetting (at saturated condition are: slow, moderately slow, moderate, moderately rapid, rapid.

3/ General drainage: rate and extent of removal of water from the soil, both by runoff and by percolation. Relative terms used are: excessive, somewhat excessive, well, moderately well, somewhat poor, poor.

4/ Erosion hazard: probable susceptibility of a soil to surface erosion on a 30 to 50 percent slope (slope class 2) when all vegetation cover including litter is removed. Relative terms used are: slight, moderate high, very high.

5/ Hydrologic group: classification of soils into four groups, A through D, are based on estimate of intake of water and runoff potential after the profile is thoroughly wetted and has had opportunity to swell. The soil surface is assumed to be undisturbed and without vegetation or litter. The grouping is tentative and subject to change as additional data are gathered. The four groups from lowest to highest runoff potential are:

A. (Low runoff potential) Soils having high infiltration rates even when thoroughly wetted and consisting chiefly of deep, well to excessively drained sands or gravels. These soils have a high rate of water transmission. (Includes Psamments except those in Lithic, Aquic, or Aquodic subgroups; soils other than those in group C or D in fragmental, sandy-skeletal, or sandy families; soils in Grossarenic subgroups of Udults and Udalfs; and soils in Arenic subgroups of Udults and Udalfs except those in clayey or fine families.)

B. (Moderately low runoff potential) Soils having moderate infiltration rates when thoroughly wetted and consisting chiefly of moderately deep and deep, moderately well and well-drained soils with moderately fine to moderately coarse textures with moderately slow to moderately rapid permeability. These soils have a moderate rate of water transmission. (Soils other than those in groups A, C, or D.)

C. (Moderately high runoff potential) Soils having slow infiltration rates when thoroughly wetted and consisting chiefly of well-drained and moderately well-drained soils with slowly and very slowly permeable layers (fragipans, hardpans, hard bedrock, and the like) at moderate depth (20 to 40 inches), soils with moderately fine to fine texture (or soils with moderate water tables). (These soils may be somewhat poorly drained.) These soils have a slow rate of water transmission. (Includes soils in Albic or Aquic subgroups; soils in Aeric subgroups of Aquents, Aquepts, Aquolls, Aqualfs, and Aquults in loamy families; soils other than those in group D that are in fine, very fine, or clayey families except those with kaolinitic, oxidic, or halloysitic mineralogy; Humods and Orthods; soils with fragipans or petrocalcic horizons; soils in shallow families that have permeable substrata; soils in Lithic subgroups that have rock that is pervious or cracked enough to allow water to penetrate.)

D. (High runoff potential) Soils having very slow infiltration rates when thoroughly wetted and consisting chiefly of clay soils with a high swelling potential, soils with a permanent high water table, soils with a claypan or clay layer at or near the surface, and shallow soils over nearly impervious material. These soils have a very slow rate of water transmission. (Includes all Vertisols; all Histosols; all Aqueds; soils in Aquents, Aquepts, Aquolls, Aqualfs, and Aquults except for Aeric subgroups in loamy families; soils with natric horizons; soils in Lithic subgroups that have impermeable substrata; and soils in shallow families that have impermeable substrata.)

6/ Estimated suitability for extensive range use: based on observations of natural forage production, use experience over wide areas, and soil and climatic characteristics. Regardless of current vegetative cover, estimates are potential suitability applied to open areas, either natural or cleared, under extensive management (without seeding or fertilization) with average herbaceous cover conditions as related to soil type. Facors such as rockiness, topography, and erosion are also considered. Estimates should not be interpreted as necessarily applying to suitability of soils for forage production under more intensive management involving seeding, fertilization or irrigation. Relative terms are: unsuited, very low, low, medium, high, very high. Unless otherwise indicated, they are applicable to soils of slope classes 1 and 2 (0 to 50 percent).

7/ Miscellaneous land areas are listed in footnote 4 to table 1.

8/ This soil supports low site Ponderosa pine on the north side of Sheep Mountain.

SOURCE: Soil Survey of the Mount Dome Planning Unit, Soil Vegetation Survey, California Department of Forestry, 1977

APPENDIX E-3

SOIL SYMBOLS AND SOME GENERAL CHARACTERISTICS OF THE SOILS

Soil Number (Name)	Depth Range Inches	Color Surface/Subsoil	Texture Surface/ Subsoil	Reaction Surface/ Subsoil	Parent Material	Relief and Slope Classes Mapped
700 [4/]						
1343 (Lorella)	10-19	Dark gray brown to yellowish brown/ dark yellowish brown to brown	Very cobbly loam/ very cobbly clay	Slightly acid slightly acid	Basic volcanic rock	Nearly level to very steep (1, 2, 3)
1361 (Clerf)	20-39	Dark gray brown to gray brown/ yellowish brown to brown	Silt loam to loam/ clay loam to clay	Medium acid to slightly acid/medium acid to mildly alkaline	Basic volcanic rock	Gently Sloping to very steep (1, 2, 3)
1363	23-37	Brown to dark gray brown/ brown to yellowish brown	Sandy loam to silt loam/ clay loam to clay	Medium acid to slightly acid/slightly acid to mildly aklaline	Basic volcanic rock	Level to steep (1, 2, 3)
1364	10-15	Gray brown to dark gray brown/ gray brown to dark gray brown	Fine sandy loam to loam/ fine sandy loam to loam	Slightly acid to neutral/ netural to moderately alkaline	Basic volcanic rock and volcanic tuff	Level to steep (1, 3)
1365	26-40	Gray brown/ yellowish brown	Loam/ sandy loam heavy	Slightly acid to netural/ neutral to slightly acid	Basic volcanic rock	Gently to strongly sloping (1)
1365v [7/]	26-39	Brown dark gray brown/ brown reddish yellow	Loam to sandy loam/ loam to sandy loam	Slightly acid neutral/ neutral	Basic volcanic rock	Gentle to strongly sloping (1)

APPENDIX E-3 (con't.)

Soil Number (Name)	Depth Range Inches	Color Surface/Subsoil	Texture Surface/ Subsoil	Reaction Surface/ Subsoil	Parent Material	Relief and Slope Classes Mapped
1368	42-82	Dark brown to dark grayish brown/ light yellowish brown to brown	Gravelly sandy loam to cobbly loam/ very stony fine sandy loam to very cobbly sandy clay loam	Slightly acid to moderately alkaline/ slightly acid to neutral	Basic volcanic rock	Nearly level to very steep (1, 2, 3)
1368v 10/	25-38	Dark gray to gray/ pale brown to yellowish brown	Very cobbly sandy loam to very cobbly loam/very cobbly sandy clay loam to very cobbly clay loam	Slightly acid neutral/ neutral	Basic volcanic rock	Nearly level to very steep (1, 2, 3)
1369	20-40 11/	Grayish brown/ very pale brown to yellowish brown	Gravelly sandy loam to coarse sandy loam/very gravelly sandy loam to very cobbly sandy loam	Neutral/ mildly alkaline	Basic volcanic rock	Nearly level to steep (1,2)
1371	20-40	Dark grayish brown/ brown	Cobbly fine sandy loam/ very cobbly sandy loam	Slightly acid/ neutral	Basic volcanic rock	Strongly sloping to steep (1, 2)
1375	9-19	Grayish brown to dark grayish brown/ brown	Cobbly fine sandy loam to very cobbly loam/ very cobbly clay loam to very cobbly loam	Slightly acid/ neutral	Basic volcanic rock	Level to moderately sloping (1)

APPENDIX E-3 Footnotes

1/

Slope class symbol	Percent slope
1	0-30
2	30-50
3	50-70
4	Greater than 70

4/ Miscellaneous land types mapped are:

Symbol	Description
700 (BL)	Lava flow (90-100% cover of basaltic lava)
700 (BR)	Rockland (90-100% cover of basic igneous rock)
700 (BT)	Talus and Rubble (90-100% cover of loose basic igneous stones and boulders)

10/ 7368V soils differ from 7368 soils in being less than 40 inches deep and having base saturation of more than 75 percent in the upper 30 inches of soil.

11/ There are inclusions of soils deeper than 40 inches in these units.

Source: Soil Survey of the Mount Dome Planning Unit, Soil-Vegetation Survey, California Department of Forestry, 1977.

APPENDIX F
CLASSIFICATION OF THE SOILS

Series Name	Mapping Unit No.s	Classification
Calimus	121	Fine-loam, mixed, mesic, Pachic Haploxeroll
Clerf	220, 1361	Clayey-skeletal mont. mesic Typic Argixeroll
Deven	100	Clayey, mont, mesic, Lithic Argixeroll
Dome*	161	Loamy, mixed, mesic, Lithic Xerorthent
Drews	211	Fine-loamy, mixed, mesic Pachic Argixeroll
Falvey*	190	Fine-loamy, mixed, mesic Pachic Argixeroll
Hammond*	110	Fine-loamy, mixed, mesic, Entic Haploxeroll
Inlow	241	Fine-loamy, mixed, mesic Haploxerolic Nadurargids
Keating	100	Fine, mont. mesic Typic Argixeroll
Langer*	140	Fine, mont. mesic, Typic Argixeroll
Lequieu*	190	Loamy-skeltal mixed, mesic Lithic Xerorthent
Lorella	220, 1343	Clayey-skeletal, mont. mesic, Lithic Argixerolls
O'Keeffe*	130	Fine-loamy, mixed, mesic, Typic Haploxeroll
Porterfield*	110	Loamy, mixed, mesic, shallow Entic Haploxeroll
Salisbury	140	Fine, mont. mesic Typic Durixeroll
Somerset	141	Fine-loamy, mixed, mesic Haploxerollic Durargids
Stukel	161	Loamy, mixed, mesic, Lithic Haploxeroll
Wrentham	200	Loamy-skeletal, mixed, mesic Pachic Haploxeroll
Unnamed*	1363	Fine, mixed, mesic Typic Argixeroll
Unnamed*	1364	Coarse-loamy, mixed, mesic Lithic Haploxeroll
" " *	1365	Fine-loamy, mixed, mesic Typic Haploxeroll
" " *	1365V	Coarse-loamy, mixed, mesic Typic Haploxeroll
" " *	1366	Fine-loamy, mixed, mesic Pachic Haploxeroll
" " *	1368	Loamy-skeletal, mixed, mesic Ultic Argixeroll
" " *	1368V	Loamy-skeletal, mixed, mesic Typic Argixeroll
" " *	1369	Loamy-skeletal, mixed, mesic Typic Haploxeroll
" " *	1371	Loamy-skeletal, mixed, frigid Typic Haploxeroll
" " *	1375	Loamy-skeletal, mixed, mesic Lithic Argixeroll

* Proposed new series

Source: Classifications for soils 121 through 241 from Soil Conservation Service. Soils 1363 through 1375 from Soil-Vegetation Survey, California Department of Forestry.

APPENDIX G

IMPORTANT BIG GAME AND WILD HORSE FORAGE

COMMON PLANT NAME	IMPORTANT TO DEER (D) ANTELOPE (A) HORSES (H)
Grasses	
Bluebunch wheatgrass	D, A, H
Sandberg's bluegrass	H
Idaho Fescue	D, A, H
Bottlebrush squirreltail	H
Cheatgrass	H
Elk sedge	H
Forbs	
Common yarrow	H
Threadstalk milkvetch	H
Wollypod milkvetch	H
Desert paintbrush	H
Tansy mustard	A
Sulphur-flowered buckwheat	H
Biscuitroot	H
Penstemon	H
Desert phlox	H
Fireweed	H
Shrubs	
Big sagebrush	D, A, H
Low sagebrush	H
Curleaf mahogany	D
Gray rabbitbrush	H
Green rabbitbrush	H
Lupine	H
Bitterbrush	D, A, H
Gooseberry	D, H

APPENDIX H

BIG GAME FORAGE ALLOCATION

Approximate big game populations, seasons of use and ranges were jointly determined with cooperation of the California Department of Fish and Game, using professional observations and data collected by the California Department of Fish and Game and BLM Biologists.

Due to the scattered pattern of public lands, an apportionment of the total deer and antelope range was used to determine how many acres of habitat was on public lands and approximately how many animals used the public lands. An additional apportionment was made to determine how many deer would use a particular allotment.

Winter Deer Herd

		Bryant Mt.	Shasta
A.	Total deer range	30,720 acres	113,300 acres
B.	Acres of BLM deer range	4,204 acres	33,385 acres
C.	Percent BLM contributes to range (B ÷ A)	14%	70%*
D.	Estimated Herd Size	5,000	18,000
E.	BLM Herd Size (D X C)	700	12,600
F.	Percent allotment acreage is of total BLM acres. Deer range = allotment acres ÷ total BLM acres (B)		
G.	Deer Nos./Allotment = F X E		

*California Dept. of Fish and Game does not feel the deer are evenly proportioned over the whole Shasta deer winter range. It is felt that BLM winters about 70% of the total deer herd.

The following procedure was used to determine how much forage (AUMs) was needed for deer and antelope in each allotment:

Assumptions:

1. The majority of deer use BLM lands from approximately Nov. 15 to April 15.

2. Deer compete for forage with livestock for approximately 2 months when their diets are similar.

3. Deer dietary overlap (similar forage items) with cattle is about 40% for 2 months (March-April) (Kufeld 1973; Leuch 1956).

4. Deer dietary overlap with sheep is about 50% for 2 months (March-April) (BLM data - Susanville District Office).

5. Antelope compete with livestock for forage for 4 months with a 50% dietary overlap (Segerstrom 1979).

6. Deer only compete for forage with livestock on areas suitable for livestock.

7. 6 deer = 1 cow AUM 14 antelope = 1 cow AUM

Allocation formula:

No. deer X 2 months ÷ 6 (deer/AUM) X percent use area in allotment X percent allotment suitable for livestock X dietary overlap (.4) = AUMs needed by allotment.

Example: Total AC. = 30,720
BLM AC. = 4,204 (14%)

Estimated deer population = 5000
Estimated deer using BLM = 5000 X .14 = 700 deer

Loveness Lumber = 685 acres (16% of all BLM) in Bryant Mt. Herd area)

16% X 700 deer = 112 deer using Loveness Lumber allotment.

Therefore, 112 deer X 2 months: 6 (deer/AUM) X 100% (Area utilized) X 100% (suitable acres) X 0.4 (dietary overlap) = 15 AUMs.

APPENDIX I

PERCENT OF BIG GAME RANGE USED BY LIVESTOCK

Allotment	Acres	Acres Unsuitable For Livestock	Acres Unsuitable For Deer*	Average Predicted Deer Use (%)	Range Suitable For Livestock Use (%)
Ericson, Don	1279	127	45	75%	90
Johnson, Stanley	559	25	0	100%	96
Johnson, Dalton	77	35	0	100%	61
Loveness Lumber	685	0	0	75%	100
Orahood	439	0	0	75%	100
Parsons/Robinson	1422	63	20	75%	96
Criss, Wayne	452	0	0	75%	100
Porterfield Rch.I	5083	812	0	75%	84
Truax-Red Rock	846	10	0	75%	99
Tablelands S.	1440	66	0	75%	100
Beck Ranch	1813	0	0	75%	100
Ericson, David	2809	1565	25	75%	99
Farnam	160	0	0	75%	100
Hadan Livestock	2328	812	0	100%	65
Johnson Stock	2529	0	0	100%	100
Langer	2197	507	5	75%	82
Moore	120	0	0	75%	100
Parsons	1240	487	25	75%	95
Parsons/Robinson	720	210	0	100%	96
Porterfield Rch.II	965	175	175	100%	82
Schader	1713	11	0	75%	91
Sites	760	0	0	75%	100
Smith	320	0	0	75%	100
Sullivan	360	16	10	75%	96
Taylor	1160	475	20	75%	61
Truax-Sheep Mtn.	600	59	0	75%	79
Tablelands N.	5774	1879	456	100%	65

*Areas covered by lava talus rock

APPENDIX J

OCCURRENCE OF MAJOR AND WOODY SHRUBBY SPECIES (BY ALLOTMENT)

KEY SPECIES BY PERCENT

	PERCENT WOODY VEG.	WESTERN JUNIPER (JUOC)	LOW SAGE-BRUSH (ARAR)	BITTER BRUSH (PUTR)	BIG SAGE-BRUSH (ARTRV)	GREY RABBIT-BRUSH (CHNA2)	GREEN RABBIT-BRUSH (CHVIV)	MTN. MAHOGANY (CELE)	LUPINE (LUPINUS)	CHERRY (PRUNUS)	CURRANT (RIBES)	MISC. WOODY SPECIES
Ericson, Don	27.6	17.0	1.5	.4	1.8	.6	-	T	-	.2	-	.1
Johnson, Stanley	7.2	1.6		.2	3.4	T	1.8					.2
Johnson, Dalton	10.0	2.0		.5	3.0	.5	3.5					.5
Loveness Lumber	12.8	1.8			10.1	T	.6					.3
Orahood	23.0	17.3	2.3	.1	1.3	.6	1.3	-	-	-	-	.1
Parsons/ Robinson	14.6	8.6	1.8	.4	2.7	.7		T			T	.4
Criss, Wayne	5.0	T	-	-	-	5.0	-	-	-	-	-	-
Porterfield Ranch I	25.2	13.3	2.0	2.1	2.8	.8	.6	2.6	T	T	T	1.0
Truax - Red Rock	13.5	8.5	1.4	-	1.0	2.6	T	-	-	-	-	-
Tablelands South	25.0	17.6	-	2.5	2.8	T	-	T	-	-	-	2.1
Bech Ranch Inc.	13.3	9.3	-	1.0	-	.6	-	-	-	-	-	2.4
Ericson, David	21.9	8.9	.7	.4	7.3	.4	.4				.5	3.3
Farnam	19.0	13.5	2.5	-	1.5	1.5	-	-	-	-	-	-
Hadan Livestock	9.0	6.0	-	-	2.0	-	1.0	-	-	-	-	-
Johnson Stock Co.	5.5	3.4	T	.2	.8	T	.7	-	-	-	-	.4

	PERCENT WOODY VEG.	WESTERN JUNIPER (JUOC)	LOW SAGE-BRUSH (ARAR)	BITTER BRUSH (PUTR)	BIG SAGE-BRUSH (ARTRV)	GREY RABBIT-BRUSH (CHNA2)	GREEN RABBIT-BRUSH (CHVIV)	MT. MAHOGANY (CELE)	LUPINE (LUPIN)	CHERRY (PRUNUS)	CURRANT (RIBES)	MISC. WOODY SPECIES
Langer	14.7	5.2	1.1	T	3.9	.9	.8	-	-	-	T	2.8
Moore	15.0	-	-	2.0	2.0	7.0	4.0	-	-	-	-	-
Parsons	22.5	11.7		1.1	3.7	2.4	1.2				1.7	2.4
Parsons/ Robinson	3.0	-	-	-	-	2.0	-	-	-	-	-	1.0
Porterfield Ranch II	5.5	-	-	-	-	3.5	2.0	-	-	-	-	-
Schader	10.6	4.0	.8	1.9	1.1	2.1	.4	-	-	-	-	.3
Sites	17.3	.3	-	2.0	2.0	7.0	4.0	-	-	-	-	2.0
Sullivan	9.5	4.0	1.0	-	3.5	-	1.0	-	-	-	-	-
Taylor	30.0	16.1	.9	-	5.8	T	.1	5.4	-	T	T	1.7
Truax - Sheep Mtn.	13.6	1.5	-	2.0	4.1	-	.6	1.3	.8	-	-	3.3
Tablelands North	7.3	-	1.1	.3	2.7	.6	1.0	-	-	-	1.5	.1

T - Trace; less than 0.1 percent

APPENDIX K
VISUAL IMPACT RATING PROCEDURE

The management classes (discussed in Chapter 2) have designated acceptable levels of change (contrast), as outlined below.

Class II: The degree of contrast for any one element should not exceed a moderate level (2X), and the total contrast rating for any feature may not exceed 12.

Class III: The degree of contrast for any one element should not exceed a moderate value, and the total contrast rating for any feature may not exceed 16.

Class IV: The total contrast rating for any feature may not exceed 20.

(from BLM Manual Section 8431)

No Class I or V areas are found on the Mount Dome public grazing lands.

Table K-3 shows the proposed projects' long-term major impacts and degrees of contrast as evaluated in Table K-2. Short-term impacts are shown in Tables K-4 and K-5. Note the highest element's and highest feature's contrast scores, then cross reference the acceptable limits for each in the three VRM classes, listed above. Unmitigated acceptable uses are indicated by a "Yes" for each management class. Scores higher than the acceptable limits are indicated by a "No" under each class.

TABLE K-1

POTENTIAL VISUAL IMPACT SOURCES BY ALTERNATIVE AND MANAGEMENT CLASS

CLASS	PROJECT OR USE	PRIMITIVE USE	LIMITED USE	MODERATE USE	EXCLUSIVE USE	NO ACTION
II	Fence construction (mi).	7.75	0	19.5	19.5	0
	Storage Tank & Trough	0	0	0	0	0
	Pipeline (mi)	0	0	0	0	0
	Reservoirs	0	3	3	3	0
	Prescribed Burns (AC)	0	0	0	0	0
	Interseed Drilling (AC)	0	0	0	0	0
	Doze and Reseed (AC)	0	0	0	0	0
	Grazing Use (AC)	0	8480	8480	8480	8480
	Grazing Use (AUMs) decrease from present	100%	94%	36%	12%	0
	Juniper Handfelling (AC)*	0	300	300	300	0
III	Fence construction (mi)	32	0	5	5	0
	Storage Tank & Troughs	0	0	0	0	0
	Pipeline (mi)	0	0	0	0	0
	Reservoirs (#)	0	2	2	2	0
	Prescribed Burns (AC)	0	0	0	0	0
	Interseed Drilling (AC)	0	0	0	0	0
	Doze and Reseed (AC)	0	0	0	0	0
	Grazing Use (AC)	0	9640	9640	9640	9640
	Grazing Use (AUMs) decrease from present	100%	94%	36%	12%	0
	Juniper Handfelling (AC)*	0	770	770	0	0
IV	Fence Construction (MI)	64.25	0	8	8	0
	Storage Tank & Trough (#)	0	1	1	1	0
	Pipeline (MI)	0	1.5	1.5	1.5	0
	Reservoir (#)	0	1	1	1	0
	Prescribed Burn (AC)	0	39	39	39	0
	Interseed Drilling (AC)	0	98	98	98	0
	Doze and Reseed (AC)	0	590	590	590	0
	Grazing Use (AC)	0	19,475	19,475	19,475	19,475
	Grazing Use % AUM decrease from present	100	94	36	12	0
	Juniper Handfelling (AC)*	0	880	880	880	0

*Reflects average indirectly impacted.

TABLE K-2

LONG-TERM CONTRAST RATING SUMMARY*

Proposed Action	Feature	Form (4) Contrast	Form (4) Score	Line (3) Contrast	Line (3) Score	Color (2) Contrast	Color (2) Score	Texture (1) Contrast	Texture (1) Score	Total Score
Fence Construction	Land-Water	0	0	1	3	1	2	1	1	6
	vegetation	1	4	2	6	1	2	1	1	13
	structures	1	4	1	3	1	2	1	1	10
Storage Tank and Water trough	Land-water	0	0	0	0	1	2	0	0	2
	Vegetation	1	4	1	3	1	2	1	1	10
	structure	2	8	1	3	2	4	1	1	16
Pipeline	Land-water	0	0	1	3	1	2	1	1	6
	vegetation	1	4	2	6	2	4	2	2	16
	structures	0	0	0	0	0	0	0	0	0
Reservoirs	Land-water	1	4	1	3	2	4	1	1	12
	vegetation	1	4	1	3	2	4	2	2	13
	structures	0	0	1	3	1	2	1	1	6
Prescribed Burns	Land-water	0	0	0	0	0	0	0	0	0
	vegetation	2	8	2	6	3	6	2	2	22
	structures	0	0	0	0	0	0	0	0	0
Interseed Drilling	Land-water	0	0	1	3	1	2	2	2	11
	vegetation	2	8	2	6	2	4	2	2	20
	structures	0	0	0	0	0	0	0	0	0
Doze and Reseed	Land-water	1	4	1	3	1	2	1	1	10
	vegetation	3	12	3	9	3	6	2	2	29
	structures	0	0	0	0	0	0	0	0	0
Grazing	Land-water	0	0	0	0	1	2	0	0	2
	vegetation	1	4	1	3	1	2	1	1	10
	structures	0	0	0	0	0	0	0	0	0
Unscheduled Maintenance	Land-water	0	0	1	3	0	0	0	0	3
	vegetation	0	0	1	3	1	2	1	1	6
	structures	0	0	0	0	1	2	1	1	3
Juniper Handfelling	Land-water	0	0	0	0	0	0	0	0	0
	vegetation	2	8	2	6	2	4	1	1	19
	structures	0	0	0	0	0	0	0	0	0

* Based upon procedures in BLM Manual section 8431, visual resource contrast rating.

TABLE K-3
Long-Term
VISUAL IMPACT ANALYSIS OF ACTIONS WITHOUT DESIGN MITIGATION

Proposed Action	Major Contrasting Element	Highest Element Contrast	Feature with highest Contrast	Highest Feature Contrast	Potential Unmitigated Impact	Acceptability in VRM Management Classes (Without Mitigation)		
						II	III	IV
Fence Construction	Form Line	2	Vegetation	13	Moderate	No*	Yes	Yes
Storage Tank and Water Trough	Form Color	2	Structure	16	Moderate	NA	NA	Yes
Pipeline	Line Color	2	Vegetation	16	Moderate	NA	NA	Yes
Reservoirs	Line Color	2	Vegetation	13	Moderate	No*	Yes	Yes
Prescribed Burn	Form Line Color	3	Vegetation	22	Very High	NA	NA	No*
Interseed Drilling	Texture	2	Vegetation	20	High	NA	NA	Yes
Doze and Reseed	Form Line Color	3	Vegetation	29	Very High	NA	NA	No*
Grazing Use	Form Color	1	Vegetation	10	Low	Yes	Yes	Yes
Unscheduled Maintenance	Line Color	1	Vegetation	6	Low	Yes	Yes	Yes
Juniper Handfelling	Form Line	2	Vegetation	19	High	No*	No*	Yes

Note
An impact's "acceptability" is evaluated in the foreground distance zone only (0-3 mile). As the distance between view and subject increases, impacts usually decrease. Contrast rating figures are shown in Table 4-3.

NA=Not Applicable. Project is not proposed in this management class.

* Procedures outlined in manual 8400 would mitigate these impacts to an acceptable level.

TABLE K-4
Short-Term
CONTRAST RATING SUMMARY*
With Design Mitigation

Proposed Action	Feature	Form (4) Contrast	Form (4) Score	Line (3) Contrast	Line (3) Score	Color (2) Contrast	Color (2) Score	Texture (1) Contrast	Texture (1) Score	Total Score
Fence Construction	Land-Water	0	0	1	3	1	2	1	1	6
	vegetation	1	4	2	6	1	2	1	1	13
	structures	1	4	1	3	1	2	1	1	10
Storage Tank and Water trough	Land-water	0	0	0	0	2	4	1	1	5
	Vegetation	1	4	1	3	2	4	2	2	13
	structure	2	8	1	3	2	4	1	1	16
Pipeline	Land-water	1	4	2	6	2	4	2	2	16
	vegetation	2	8	3	9	2	4	2	2	16
	structures	0	0	0	0	0	0	0	0	0
Reservoirs	Land-water	1	4	1	3	3	6	2	2	15
	vegetation	2	8	2	6	2	4	2	2	20
	structures	1	4	1	3	1	2	1	1	10
Prescribed Burns	Land-water	0	0	0	0	0	0	0	0	0
	vegetation	2	8	3	9	3	6	2	2	25
	structures	0	0	0	0	0	0	0	0	0
Interseed Drilling	Land-water	0	0	1	3	1	2	2	2	11
	vegetation	2	8	2	6	1	2	2	2	18
	structures	0	0	0	0	0	0	0	0	0
Doze and Reseed	Land-water	1	4	2	6	2	4	1	1	15
	vegetation	3	12	3	9	3	6	3	3	30
	structures	0	0	0	0	0	0	0	0	0
Grazing	Land-water	0	0	0	0	1	2	0	0	2
	vegetation	1	4	1	3	1	2	1	1	10
	structures	0	0	0	0	0	0	0	0	0
Unscheduled Maintenance	Land-water	0	0	1	3	0	0	0	0	3
	vegetation	0	0	1	3	1	2	1	1	6
	structures	0	0	0	0	1	2	1	1	3
Juniper Handfelling	Land-water	0	0	0	0	0	0	0	0	0
	vegetation	2	8	2	6	2	4	2	2	20
	structures	0	0	0	0	0	0	0	0	0

* Based upon procedures in BLM Manual section 8431, visual resource contrast rating.

TABLE K-5
Short-Term
VISUAL IMPACT ANALYSIS OF ACTION WITH DESIGN MITIGATION

Proposed Action	Major Contrasting Element	Highest Element Contrast	Feature with highest Contrast	Highest Feature Contrast	Potential Unmitigated Impact	Acceptability in VRM Management Classes (Without Mitigation) II	III	I
Fence Construction	Form Line	2	Vegetation	13	Moderate	No*	Yes	Ye
Storage Tank and Water Trough	Form Color	2	Structure	16	Moderate	NA	NA	Ye
Pipeline	Form Line	3	Vegetation	16	Moderate	NA	NA	Ye
Reservoirs	Form Color	3	Land-water Vegetation	20	High	No	No	Ye
Prescribed Burn	Form Line Color	3	Vegetation	22	Very High	NA	NA	NA
Interseed Drilling	Texture	2	Vegetation	18	High	NA	NA	Ye
Doze and Reseed	Form Line Color	3	Vegetation	30	Very High	NA	NA	No
Grazing Use	Form Color	1	Vegetation	10	Low	Yes	Yes	Ye
Unscheduled Maintenance	Line Color	1	Vegetation	6	Low	Yes	Yes	Ye
Juniper Handfelling	Form Line	2	Vegetation	20	High	No	No	Ye

Note
An impact's "acceptability" is evaluated in the foreground distance zone only (0-3 mile). As the distance between view and subject increases, impacts usually decrease. Contrast rating figures are shown in Table 4-3.

NA=Not Applicable. Project is not proposed in this management class.

APPENDIX L

CALIFORNIA MOUNT DOME EIS AREA BEEF COW ENTERPRISE

Sales	Number	Aug. wt.	Price	Total Value
Steer calves	64	400	51.00	13,056.00
Heifer calves	41	375	40.33	6,200.73
Cull cows	19	900	22.00	3,762.00
Total				23,018.73
Total/cow				153.46

Cash Costs	Total value	Value/cow
BLM Permits	37.50	.25
Forest Service permits	1,392.65	9.28
Hay	4,976.88	33.18
Irrigated pasture	1,625.00	10.83
Salt and mineral	121.29	.81
Veterinarian and medication	150.00	1.00
Trucking	72.50	.48
Marketing	108.80	.73
Fuel and lubricant	1,007.11	6.71
Repairs	943.77	6.29
Hired labor	50.76	.34
Interest on operating capital	1,116.61	7.44
Land tax	2,221.93	14.81
General farm overhead	1,205.10	8.03
Other taxes	271.20	1.81
Insurance	674.69	4.50
Total	15,975.70	106.50
Other Costs		
Family labor	7,030.00	46.87
Management	2,181.71	14.54
Depreciation	3,570.86	23.81
Interest on investment		
Other than land	6,812.73	45.42
Interest on land	22,459.91	149.73
Total	42,055.21	280.37
Total all costs	58,030.91	386.87
Return above cash costs	7,043.03	46.95
Return above cash costs and family labor	13.03	.09
Return to total investment	-3,557.83	-23.72
Return to land investment	------	---

Source: Dr. Kerry Gee; Economics, Statistics and Cooperative Service, U.S. Department of Agriculture

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